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ERRATA.

Page 32, line 18. *Instead* of "opponents" *read* "components."

Page 81, line 26. *Instead* of "1,500,000*l.*" *read* "4,000,000*l.*"

JOURNAL OF THE ROYAL STATISTICAL SOCIETY.

JANUARY, 1910.

*On the REPRESENTATION of CERTAIN EXAMINATION RESULTS in
TWO and in THREE DIMENSIONS.*

By DR. W. GARNETT, M.A.

[Read before the Royal Statistical Society, December 14, 1909.]

IN the spring of 1909 rather more than 20,000 children were presented for the Junior County Scholarship Examination conducted by the Education Committee of the London County Council. The children were all drawn from the public elementary schools of London; they were all between 11 and 12 years of age on the 31st July last; and they had practically all reached the Vth or higher standard. In some cases the boys and girls had been taught in mixed schools by men or women indiscriminately. In the majority of cases the boys had been drawn from boys' departments taught by men, and the girls from girls' departments taught by women. No attempt has at present been made to separate the results of the examination according as the children came from boys', girls' or mixed departments or were taught by men or women. In the examination the papers were the same for all candidates. A large number of examiners were employed—some men, some women—all marking in accordance with the standards laid down by the Chief Examiner, and the papers were distributed indiscriminately among the examiners. As there were in round numbers 10,000 boys and 10,000 girls, drawn from considerably more than 1,000 school departments, and taught at the time by about 3,000 separate teachers, it may be fairly considered that accidents due to individuals have been almost eliminated from the examination results.

The examination comprised a paper upon arithmetic intended as a test of intelligence, with a second part consisting of problems requiring some thought; a story which the children were allowed to read and afterwards to write out in their own language, with a few questions intended to test their understanding of the story; and, in addition, some simple questions to test the children's power of observation and of describing common things as well as their

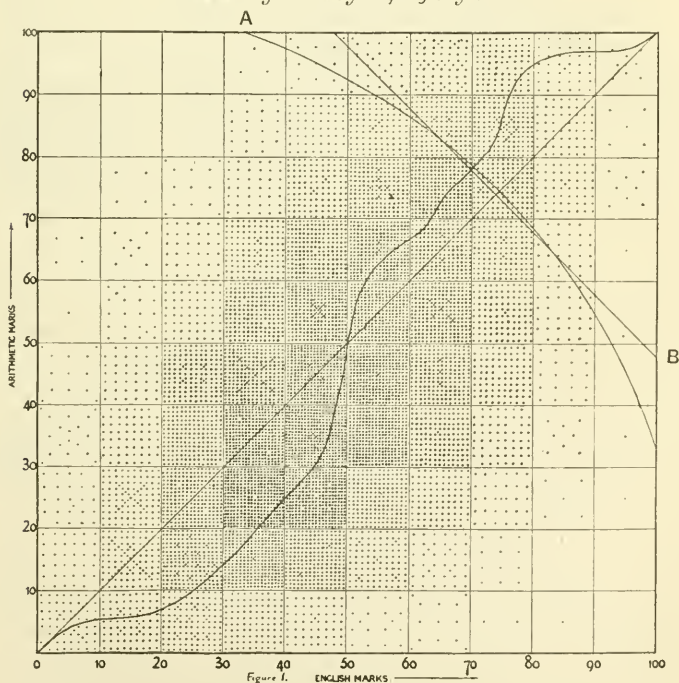
ability to make simple sentences containing words the meanings of which were well known to them. Marks were given for writing, spelling and composition. The examination thus consisted of two parts—namely, arithmetic and English, 100 marks being assigned to each.

From the reports of the examiners and the statistical tables which they submitted, it seemed clear that there was a distinct difference between the boys and the girls with regard to their relative power of dealing with the English portion and the arithmetical portion of the examination. In order to test this further, I constructed separate correlation diagrams for boys and for girls, the English marks being set out horizontally and the arithmetic marks vertically. The marks gained by each candidate were indicated by a dot placed on the diagram, the co-ordinates of which corresponded to the marks in English and arithmetic respectively; but for this purpose the marks in each subject were grouped in tens, so that the diagrams consisted of 100 squares. At the time the diagrams were made, not quite all the mark sheets were available, and the diagrams shown indicate the results from 10,105 boys and 9,396 girls. The method of construction was the following:—The mark sheets for the boys and the girls were each divided into about half a dozen groups, and in the first instance a diagram was made for each group, in order that the number of dots in any square should not be more than could be conveniently inserted in a half-inch square and afterwards counted. The number of dots in each square was counted, and transferred in Arabic figures to a new diagram. The numbers in each set of six diagrams were then added together, and from these numbers the final diagrams shown in Figs. 1 and 2 were made. In order to insert the dots symmetrically in each square, a number was selected of the form of n^2 or $n(n + 1)$ approximating as nearly as possible to the actual number. The dots were then set out in n rows and n columns or n rows and $n + 1$ columns as the case might be, a few additional dots being inserted or a few dots omitted more or less symmetrically so as to secure the exact number of dots required. The chief features of the correlation diagrams are apparent to the eye by the toning afforded through the varying density of the dots. The diagrams in fact form a half-tone illustration, differing from an ordinary half-tone print prepared from a screen negative by the toning being caused by the variation in the number of dots per square inch instead of their magnitude. It will be observed that upon each diagram the diagonal line drawn upwards from left to right corresponds to equal marks in English and arithmetic. All the candidates who lie below this diagonal obtain more marks

in English than in arithmetic; those above it obtain more marks in arithmetic than in English. The diagrams show at once that the weaker candidates on the whole did better in English than in arithmetic, and the stronger candidates did better in arithmetic than in English.

Lines of equal merit, as estimated by the sum of the marks, are lines parallel to the diagonal of the square sloping downwards from the left. If we draw a series of straight lines in this direction the numbers contained in the several squares indicate the distribution of the candidates between arithmetic and English when their merit, as gauged by the sum of the marks, is the same. If on each of these lines we select the square in which the number is the greatest, we obtain a series of modes indicating the position of the greatest number of candidates of each standard (differing by 10 marks on the total of 200) of total merit. The modes thus determined differ very slightly from those obtained either from the horizontal rows or vertical columns, that is, by considering the positions of the candidates in English who obtain equal marks in arithmetic or the position of the candidates in arithmetic who obtain equal marks in English. For the purpose of the

Marks gained by 10,105 boys.



Marks gained by 9,396 girls.

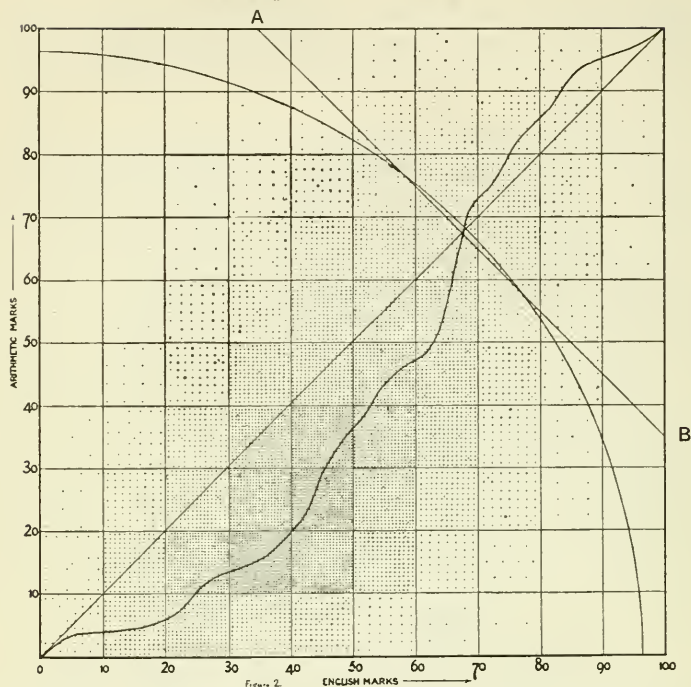


Figure 2.

comparison it seemed best to deal with candidates of equal merit in the whole examination. The smooth curve drawn through these modes is shown on each diagram by the irregular line. In smoothing off this curve regard has been had to the slope of the numbers along each line of equal merit, so that when the numbers contained in two squares were very nearly equal the line has been drawn within the square containing the largest number, but very near to the boundary separating it from the square containing the next largest. It will be observed that in the diagram relating to the boys this line of modes cuts the line of equal merit at, or very near, the centre of the whole diagram. That is to say, when boys gain more than half marks in the whole examination they begin to do better as a whole in arithmetic than in English, but those who gain less than half marks in the whole examination do better as a whole in English than in arithmetic. In the case of the boys, about 42 per cent. lie above the intersection of the line of modes with the line of equal merit in the two subjects. The line AB, corresponding to 147 marks in the whole examination, cuts off the best 800 candidates, and this line will be called the line of distinction. In the case of the girls the line AB which cuts off the best 800 girls corresponds to a

total of 135 marks ; and it will be observed that the line of modes does not cut the line of equal merit until it has passed beyond this line, so that it is only among the highest 7 per cent. or $7\frac{1}{2}$ per cent. of the girls that the majority do better in arithmetic than in English. This peculiarity in the line of modes in the two diagrams seems to indicate a distinct difference between the boys and girls either in their natural ability to deal with the two subjects or in the character of the training which they have received. It seems desirable that, in future examinations, similar diagrams should be made separately for boys who have been taught by men, boys who have been taught by women, girls who have been taught by men, and girls who have been taught by women ; and it might also be interesting to make additional diagrams for boys and girls separately who have been taught in mixed classes, whether by men or by women. It seems probable that much of the difference is due to traditional forms of teaching, when it is remembered that the standard required by the Board of Education in arithmetic in the certificate examination is different for men and for women, and that for some hundreds of years the practice of the elementary school was to teach boys the keeping of accounts, but in place thereof to teach girls needlework.

Having prepared the two-dimensioned diagrams, it occurred to me that their peculiarities would be more clearly presented to the eye by a solid model, and I accordingly constructed two models in which the ordinates represent the numbers in the corresponding squares of the diagrams on the scale of 100 candidates to the inch. These models are shown in Figs. 3 and 4 in isometric projection.

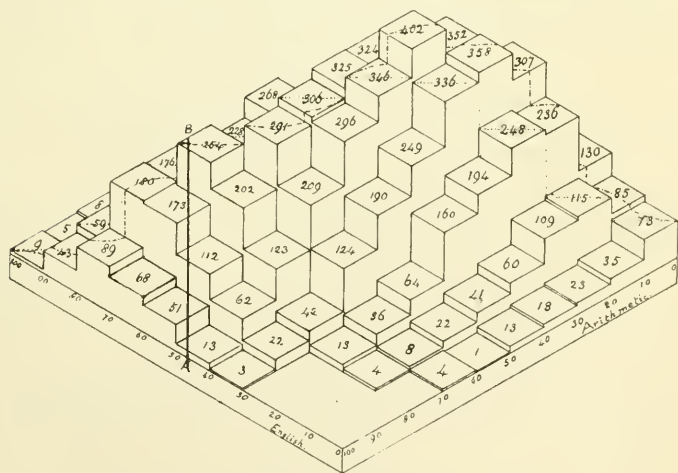


Figure 3.—10,105 boys.

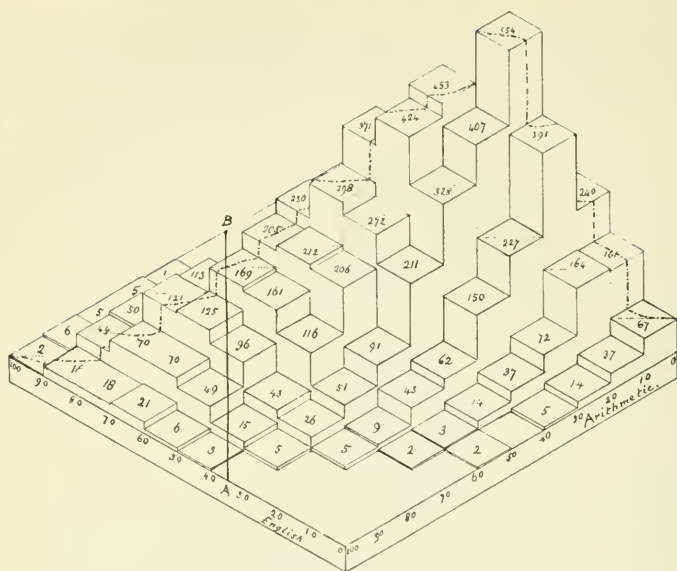


Figure 4.—9,396 girls.

To give the most characteristic view of the models they have been turned so that the point corresponding to full marks in arithmetic and zero marks in English is nearest to the observer. The planes of equal merit, gauged by the sum of the marks, appear as vertical straight lines, of which the line AB is an example. The great differences between the boys and girls are brought out prominently by the forms of the two mountain masses, and it will be noticed how nearly all the peaks in the girls' model lie on the English side of the dotted line of equal marks in the two subjects, and how low that line lies upon the mountain slope. The concave profile from the highest peak to the point corresponding to full marks in the girls' model contrasts very markedly with the convex profile in the boys' model. On the models the line of modes, shown in Figs. 3 and 4 by the broken line, forms what the geographers would call a watershed or divide, the surface sloping downwards both to the right and left as we travel along the line. It should further be noted that the difference between the relation of the line of modes to the line of equal marks in the two subjects on the two models is much more conspicuous than on the two-dimensional diagrams. A mere glance at the models suggests that there must be some essential difference between boys and girls in their training, or in their natural ability to deal with English and arithmetic.

At an early stage it occurred to me that if, in dealing with two

such diverse subjects as arithmetic and English, lines of equal merit were taken as circles on the correlation diagram, having their centre at the zero point, so that the total marks were reckoned as $\sqrt{x^2 + y^2}$ instead of $x + y$, the difficulty so commonly felt by examiners in dealing with scrappy marks in one subject would be eliminated automatically, as 80 marks in arithmetic and 10 in English would count only as 80.6, while 80 marks in English and 20 in arithmetic would count as 82.4, and full marks in one subject would be 70.7 per cent. instead of 50 per cent. of the total. I therefore drew upon the dotted diagrams the circles shown in Figs. 1 and 2, so as to cut off 800 candidates, the same number as were cut off by the line AB, which I have called the line of distinction. The result was that both in the case of the boys and of the girls only 19 candidates were exchanged. It seems, therefore, that in dealing with candidates of the average age of $11\frac{1}{2}$ from the elementary schools the correlation between English and arithmetic is such that the sum of the marks serves sufficiently well for defining the merit of the candidates. In the case of older candidates, where specialisation is so much more marked that the correlation coefficient may even be negative, the difference between the circles and the straight lines would have been much greater in respect of the number of candidates affected. It may fairly be contended that when a competitive examination comprises a number of different subjects the marks should be added as vectors, the direction of which depends on the nature of the subject. When the subjects are closely related, the vectors should be nearly in the same direction; when there is little or no connection between the subjects, the vectors may be at right angles. The main difficulty would be to secure an agreement between the examiners as to the θ and ϕ of their several subjects.

The position of several of the candidates who were very near the line of distinction was considered, not only in connection with the marks gained in the examination, but also in relation to their school reports, based largely on the results which they had achieved in former school examinations. It occurred to me to ascertain to what extent the school records introduced the 19 specialists, who in each case would have come into the first 800, if the circle instead of the straight line had been adopted. To ascertain this I plotted the positions of all these candidates accurately to half a mark. I found that, especially among the girls, the candidates thus brought in were those who did approximately equally well in the two subjects. In other words, specialisation is not favoured in the elementary schools among children of the age of $11\frac{1}{2}$. Perhaps this is as it should be.

DISCUSSION *on* DR. GARNETT'S PAPER.

MR. YULE said that, as he was partly responsible for the reading of Dr. Garnett's paper before the Society, he would like to express his appreciation of and interest in the results. He had never seen any diagram which brought out similar curious results of examinations in different subjects. He could not attempt to suggest reasons for the curious differences between boys and girls in the marks obtained in arithmetic and English; but they were certainly in the direction one would have expected. One was accustomed to the boy who could do well at arithmetic, but whose English was hopeless; and also to the girl whose English might be quite competent, but whose arithmetic was hopeless. Further, as the results were obtained from such a large number of examinees, the result was definite and trustworthy. The difference in form between the two models was especially marked. In the case of the girls, the whole mass of the returns was crowded very much more closely round the central line of the model; the correlation was higher. In the case of boys it was rather lower. He wished those principal forms of difference could be explained in some way. The whole result suggested a wide vista in the discussion of examination results and the differences they indicated between boys and girls. But he would like to know whether they were the results of the number of marks obtained by a number of different Examiners, so as to cut out fairly personal equation.

DR. GARNETT said there were a large number of Examiners, but they all examined under strict rules as to the manner in which they should deal with the errors, all of which could be foretold when dealing with such simple questions with a large number of candidates. All the results passed through the hands of the Chief Examiner afterwards.

MR. YULE said in that case they might regard the personal equation of the Examiner as eliminated; and there remained only the personal idiosyncrasies of the candidates.

MR. SYDNEY YOUNG said his personal experience rather differed from the result shown. He had been educated at a mixed school. Notwithstanding that the girls were fewer in number, they generally obtained higher places in the class on all subjects. That might be due to the girls being of a better class than those treated of by Dr. Garnett. Certainly the girls generally obtained higher places in the classes. They did not, however, get the highest place, which was obtained by the boys, and they tended to deteriorate at the age of 14 or so, both mentally and physically. He did not know whether it was a question of better heredity.

THE PRESIDENT, in proposing a vote of thanks to Dr. Garnett for his communication, said he hoped this would not be the author's last appearance among them. It seemed to him that the subject required a considerable amount of investigation on the lines Dr. Garnett had indicated. They had at present the mere outline expressed in three dimensions, which was exceedingly instructive, but made it clear they had to investigate the psychology not only of the pupils but of the teachers. If they could differentiate the results, as tested by examination, of teaching at different centres, of different classes, by different sexes, and, generally, under different conditions, they would have a much more instructive result even than the one presented.

NOTES *on* SOME DIFFICULTIES MET WITH *in* INTERNATIONAL
STATISTICAL COMPARISONS.

By AUGUSTUS D. WEBB, B.Sc.

[Read before the Royal Statistical Society, December 14, 1909.]

DESPITE the great amount of attention that statisticians have already given to the difficulties attendant upon the comparison of statistics collected by, and relating to, different countries, the subject is so important and has such practical bearings that some further discussion cannot be altogether useless. It is for the purpose of initiating such a discussion, and not of exhaustively treating the subject-matter, that this paper has been written. The canons which should govern the collection and presentation of statistics were concisely stated by Mr. A. L. Bowley in his paper on "The Improvement of Official Statistics," read before this Society in June, 1908. (See vol. lxxi of the Journal.) The condition of most fundamental importance to the proper understanding and interpretation of any statistics is precise definition of the statistical unit dealt with. So obvious is the necessity for the fulfilment of this condition that one can regard only with amazement its persistent violation in the majority of statistical works. Even official publications of all kinds are found lacking in this essential condition of adequate definition, and it can therefore cause no surprise that the same deficiency should be observed in non-official works, which very largely derive their statistics either immediately or ultimately from official sources. Another condition of primary importance for comparative purposes is identity of definition in respect of the same kinds of phenomena, or, where this identity does not obtain, it is necessary to know exactly what are the differences of definitions. It is to the greater or less departure from these conditions that most of the difficulties of international statistical comparisons are to be attributed. Any difficulties not arising in these ways will probably be found to be due to absolute incomparability of the subject-matter under consideration. The various kinds of difficulties may be broadly classified as those due to :—

- (1.) Inadequate definition ;
- (2.) Non-identity of definition ;
- (3.) Absence of information showing in what particulars unlike definitions really differ ;

(4.) Differences in the periods of time for which statistical returns are collected. This is really a special case of differences in definition, but it is important enough to deserve special mention ;

(5.) Differences in the classification of statistics—another special and important case of differences in definitions ;

(6.) Varying degrees of incompleteness of statistics covering the same subject-matter. This case has an extensive aspect, where the statistics, though complete so far as they go, do not cover the whole ground (*e.g.*, birth statistics in the United States of America). There is also an intensive aspect, where the statistics, though nominally covering the whole ground, are incomplete through faulty collection (*e.g.*, statistics of stillbirths in Servia) ;

(7.) Lack of particular kinds of information necessary to a complete comparison ; and

(8.) Absolute incomparability, arising from what may be called organic differences in the subject-matter, as distinct from the deficiencies in the statistics relating to that subject-matter.

I propose to discuss a few examples from important bodies of international statistics, in which these difficulties are frequently met with, and as frequently ignored in popular literature, if not in more cultivated and specialised quarters.

Perhaps the best known examples of difficulties arising from insufficient definition are to be found in statistics of international trade. To take a simple and familiar case, suppose one wishes to contrast the excess of imports into the United Kingdom with the excess of exports from the United States. To begin with, the United States trade year ends on June 30, and that of the United Kingdom on December 31, and the differences between imports and exports might obviously vary according to the trade year adopted. From the monthly trade returns, figures for identical years might of course be obtained. But the statistical year-books or annual abstracts of the United Kingdom, France, Germany, and the United States, in which trade statistics for foreign countries are given, retain the official trade years of the several countries of the world, and afford no means of comparing identical periods in those cases where the official periods differ. Suppose, however, we ignore this point, and also assume that the general imports and exports of the United States are analogous to the total imports and exports of the United Kingdom, and that neither country includes in its trade returns any items which would not be included by the other. Suppose we assume, further, that the actual errors in the collection and compilation of the statistics are compensating errors. These are big assumptions to make, and the information at our disposal does not

permit of our gauging their relation to actual facts. We have then this statement:—

	General Imports.	General Exports.	Excess of Imports.	Excess of Exports.
	£	£	£	£
United Kingdom (1906)	608,000,000	461,000,000	147,000,000	—
United States (1906-07)	299,000,000	392,000,000	—	93,000,000

How true is it to say that if the excess of imports into the United Kingdom in 1906 was 147,000,000*l.*, the excess of exports from the United States in 1906-07 was 93,000,000*l.*? The recorded value of British imports is their value at the port of disembarkation, including the cost of insurance and freight, but excluding customs duties. The recorded value of the United States imported merchandise is generally "the actual market value or " wholesale price of such merchandise as bought and sold in " usual wholesale quantities at the time of exportation to the " United States in the principal markets of the country from " whence imported, and in the condition in which such merchandise " is there bought for exportation to the United States, or consigned " to the United States for sale, including the value of all cartons, " cases, crates, boxes, sacks and coverings of any kind, and all other " costs, charges and expenses incident to placing the merchandise " in condition ready for shipment to the United States."¹ That is to say, the recorded value of United States imports does not include the cost of insurance and freight. If we accept the Board of Trade calculation in the first "Fiscal Blue Book"² that the cost of insurance and freight is, on the average, somewhere about 10 per cent. of the value of imports, we must conclude that all values of United States' total imports require to be increased by about 10 per cent. to be at all comparable with British total imports. On this basis, the sum of 299,000,000*l.* given above as the value of the United States' imports becomes 329,000,000*l.* As regards exports, the recorded value of British exports is the value on board ship at the port and time of embarkation. The recorded value of United States' domestic exports (which are about 98 per cent. of the total exports) is their value "at the time of exportation in the ports of " the United States whence they are exported," while the recorded value of re-exports is their import value. Roughly, then, the

¹ "Annual report on the foreign commerce and navigation of the United States," Washington.

² "Memoranda, statistical tables and charts . . . bearing on British and foreign trade and industrial conditions." [Cd-1761.] 1903.

valuation of United States' exports may be taken as similar to that of British exports and comparable therewith. But since the United States' imports are to be increased by about 10 per cent., or in 1906 by about 30,000,000*l.*, the excess of exports must be reduced by that sum, that is, from 93,000,000*l.* to 63,000,000*l.*, to give an amount which can properly be contrasted with the excess of British imports.

This correcting factor of 10 per cent. is, of course, a very rough one. It assumes that the recorded values of the world's total imports are their values at the ports of the several importing countries, an assumption which, as just shown, is not correct, and tends to make the factor rather too large. But while it may, for practical purposes, be applicable to the value of the aggregate of imports into the United States, it by no means follows that it is equally satisfactory if applied to the value of particular groups of imports, the freight rates for which might differ considerably from one another. Neither is it equally applicable to imports which are transported across 3,000 miles and those which have to cross 10,000 miles, although the differences of freight rates in this case may not be so marked as in the previous case. To determine the best correcting factor to be used in respect of particular imports would require special investigations, in which freight rates would be an essential *quæsitum*.

The analysis just given will serve as an illustration of some of the difficulties experienced and assumptions which have to be made in the use of trade statistics. A more legitimate use of these statistics would be facilitated if, in all statements of foreign trade, such, for example, as in the Board of Trade "Statistical Abstract for Foreign Countries," a table were included giving as concisely as possible the meaning attached by each separate country to its imports and exports, both "general" and "special," and a description of the methods of valuating them, and also a further table showing, for the more important commodities, typical freight rates between the world's great ports. Such a table, in fact, would be a continuation and extension of the table of freight rates included in the second "Fiscal Blue Book."³

It is an easy step from the subject of trade to that of shipping. Here again comparisons are vitiated by non-identity of definition. If we turn to the annual merchant shipping returns published by the Board of Trade, we find, for example, that the recorded tonnage of registered vessels belonging to Germany is the net tonnage of ships of 17½ tons and upwards; of those belonging to

³ "Second series of memoranda, statistical tables and charts . . . bearing on British and foreign trade and industrial conditions." [Cd-2337.] 1904.

the United States, it is the gross tonnage of ships of 5 tons gross and upwards; and the tonnage of the vessels of the United Kingdom is the net tonnage of apparently all ships. What sort of comparison is possible between these three typical groups of facts? Further, the records of port entrances and clearances of vessels engaged in trade show net tonnage in the case of most countries (*e.g.*, the United Kingdom, Russia, Norway, Sweden, Germany, Belgium, France, Italy, United States, &c.), and gross tonnage in some other cases (*e.g.*, Holland, Portugal, and Spain). The "Statistical Abstract for Foreign Countries," already referred to, merely states that the tonnage figures of entrances and clearances are given "in English measurement." It may be noted that the tonnage of Holland's merchant navy is stated as net, but that of port entrances and clearances as gross; while in the case of the United States, and in recent years Japan, the reverse holds good. We find, further, in the merchant shipping returns that the Board of Trade profess ignorance of whether the figures quoted for Greece, and possibly some other countries, are net or gross tonnage, while we also learn that Belgium's system of calculating net tonnage differs from the British. The best remedy for this variety of practice and definition is of course for all countries to agree on an uniform definition and method of measurement of the tonnage of ships, and to include in the published returns all ships above a certain size. This may or may not be practicable. In any case, the Board of Trade might not unreasonably be expected to ascertain whether the tonnage given for Greece, and other similarly situated countries, is really net or gross. Nor should it be impossible to obtain some factor or factors by the use of which gross tonnage figures might be approximately converted into net tonnage figures, or *vice versa*. Roughly, it might perhaps be taken that in the case of steamships net tonnage is on the average about 60 per cent. of gross tonnage.

But this non-identity of definition is not the only difficulty with which we have to contend in any endeavour to secure a fairly accurate comparison of merchant navies. A consideration of great importance is the speed constitution of those navies. A vessel of 5,000 net tons capacity which carried three cargoes in a given time would probably be of more value than a vessel of 7,000 net tons capacity which carried only two cargoes in the same time. To put the case generally, the carrying capacity of a country's merchant navy is a function of three factors—the number of ships, their tonnage, and their speed. In published statistics only the first two are given. The third may or may not be attainable, but an indication of it might possibly be given by the ages of the vessels, whose

carrying capacity could be more or less discounted according to that age, just as we discount the fighting power of a battleship according to its age—not because it is old, but because during time there is decay on the one hand and progress on the other. Germany, I find, does give the age-constitution of her merchant marine,⁴ though I am not aware that any other country does. It may, of course, be assumed that the merchant navies of the world are of about the same age (and therefore speed) constitution, in which event age (or speed) may be neglected in comparisons. But I am inclined to doubt whether such an assumption is justified even with regard to the principal nations.

Another great body of international statistics full of pitfalls for the unwary is that descriptive of agricultural production. The fact that many European countries deal in metric measures, the United Kingdom and British Colonies in English measures, and other countries in other measures, is extremely inconvenient, but easily allowed for. Even our own Board of Trade in one and the same publication (“Statistical Abstract for the United Kingdom”) state imports and exports of corn in hundredweights, and home production in bushels, without any hint of the relation between the two measures. Is it too much to hope that some day both kinds of facts will be expressed in identical measures? I wish, however, rather to direct attention to the following illustration. The production of oats in Germany in 1906 is given in the “*Statistisches Jahrbuch für das Deutsche Reich, 1908*,” as about 8,430,000 metric tons. In the “*Annual Returns of Agricultural Statistics*”⁵ of our Board of Agriculture and Fisheries this quantity is given in the English equivalent as about 59,560,000 quarters, *i.e.*, about 476,000,000 imperial bushels. The year-book of the United States Department of Agriculture⁶ gives the same production in the American equivalent as about 581,000,000 Winchester bushels. Now the English imperial bushel is approximately 3 per cent. larger than the Winchester bushel. But the United States statement of Germany’s oats production is about 20 per cent. greater than the English statement. The explanation of the discrepancy is simply that the German production of oats is expressed by weight (metric tons), which is converted by our Board of Agriculture at the rate of 39 or 40 lbs. per bushel, and by the United States Department of Agriculture at the rate of 32 lbs. per bushel. One may safely say that if the Germans expressed their own oats’ production in bushels

⁴ “*Statistisches Jahrbuch für das Deutsche Reich.*” Berlin.

⁵ “*Agricultural Statistics, 1906.*” Vol. xli, part iv. [Cd-3281.]

⁶ “*Year-book of the United States Department of Agriculture, 1907.*” Washington, 1908.

they would most probably accept neither 32 lbs. nor 40 lbs. as the equivalent of a bushel. This is a pure case of non-identity of definition as to what is a bushel of oats. The illustration is a striking instance of what must be repeated indefinitely throughout the range of international agricultural statistics, and gives rise to the question of what sort of comparison one would be justified in making between the recorded production of one country and that of another, assuming the statistics cover the whole, or the same proportion, of the production in each country. It seems at least clear that all publications containing statistics of agriculture in different countries should contain the most complete definitions possible of the measures of production used in the several countries, and a statement of their relations one to another.

I turn now to a class of statistics already important, and likely to become much more so, namely, vital statistics. The comparison of statistics of causes of death is notoriously difficult on account of the variety of classifications of such causes, and of the different diagnoses which different doctors may make of similar cases. The classification difficulty is one to be remedied by international agreement, and much has already been done in this direction. The second difficulty is to be removed by the greater diffusion of knowledge and greater uniformity of practice among the medical profession. I wish rather to speak of statistics of births, and especially of infantile mortality. These statistics are of the greatest importance, and though I have not yet noticed that in popular literature the United Kingdom is asserted to be better or worse than, say, France, because the birth-rate or infantile death-rate is higher or lower in one country than in the other, yet such invidious comparisons are not at all unlikely to be dragged into the arena of strife, especially considering the extensive advertisement that London's death-rate received recently on our hoardings. In these statistics two difficulties are well exemplified. One is the non-coincidence in the extent of the statistics. For example, the United States vital statistics cover at present only a part of the Union, while English statistics cover the whole country. The varying degrees of completeness of registration form an example of the intensive aspect of the same difficulty. For instance, it is said⁷ to be not unlikely that the recorded increase in infantile mortality in the United Kingdom during the closing decades of last century was largely due to fewer infants who died within a few days of birth being treated as stillborn and so escaping registration in the later years than in the earlier. Again, the apparently

⁷ "Statistique internationale du mouvement de la Population. Résumé rétrospectif depuis l'origine des Statistiques de l'Etat civil jusqu'en 1905." Paris. Imprimerie nationale, 1907.

favourable position of Servia and Bulgaria, as regards the numbers of stillbirths, is no doubt to be mainly attributed to incomplete registration. All these are difficulties which will, or should, vanish as administrative machinery is perfected, though it is, of course, very necessary to know of such deficiencies. But the principal difficulty in these statistics lies, I think, in the extreme diversity that exists in the definition of the term stillborn, and in the statistical treatment of stillbirths. The period of gestation after which the human foetus is legally described as an infant is seven months in Germany, Hungary and Spain; twenty-eight weeks in Norway and Denmark; six months in Belgium, Austria and Switzerland; and four months in France. In Holland there are no legal prescriptions on this matter, and the woman is accordingly free to consider her stillborn product as a foetus or an infant. The circumstances in which an infant may be recorded as a live or still-birth vary from country to country almost as much as the definition of infant. In Holland, Belgium and France a child is registered as a livebirth only if alive at the time of registration, which may be three days after birth. In most countries, however, it is registered as a livebirth if it has given any sign whatever of life, except that in Christiania and Spanish towns it is recorded as a stillbirth unless it lives at least twenty-four hours.⁸ In the United Kingdom stillbirths are not registered.⁹ It is obvious that the existence of such varied definitions and practices must vitiate any close comparison of international statistics of births, and especially of infantile mortality during the first few weeks after birth. The inclusion or exclusion of stillbirths may affect general birth and death-rates as much as 5 per cent., and the effect on infant mortality-rates must be much more considerable. Is it too much to expect that an international assembly of doctors might agree on what is a stillbirth, and that the registration laws of the several countries might be brought into line with one another? Meanwhile, no international statistics of the kind under consideration should be published without a statement of what is meant by stillbirths in each country; what are the conditions governing their registration; and whether registration generally is fairly complete or not.

An entirely different class of statistics from those yet discussed, and one presenting some of the greatest difficulties in comparisons, yet one with respect to which comparisons are frequently made, is the class of wages statistics. Here it is a case of definition

⁸ See "Tableaux de Statistique démographique comparée de quelques grandes villes du monde dans les années 1899-1907." Amsterdam, Johannes Müller, 1908.

⁹ Dr. Dudfield pointed out in the subsequent discussion that this was not now the case, since stillbirths had just begun to be registered in the United Kingdom.

in the widest sense. What are wages? From current popular literature one might suppose they were a rate of money per hour, or per day, or per week, with no suggestion that such a rate may be a "standard rate," or the arithmetical average of a number of rates actually paid, or the "modal" rate actually paid, or the rate in a particular locality, or any one of a number of such things. It may happen that the only rates published are, for a certain trade in one country, actual earnings, and, in another country, the standard rates. For instance, in the Board of Trade report on cost of living in French towns,¹⁰ the wages quoted for the engineering trades are, in England and Wales, standard time rates, and in France rates "based on returns of earnings in an ordinary week." How are these to be compared without knowing the relation of actual earnings to standard rates in one country or the other? But the money rate per unit of time or work, whether standard or any other rate, is after all the least important thing about wages. If the French artisan earning 8*l.* per hour is as strong and healthy, as well fed, clothed, and housed, if, in a word, he has his economic wants as satisfactorily met as the English artisan getting 10*l.* an hour, can it be really maintained that economically the Frenchman is more badly paid or is worse off than the Englishman? Wages, in fact, from the international, if from no other, point of view, are not money rates, but economic goods, tangible and otherwise, which the worker can and does get in return for his labour, and wages in different countries can only be properly compared when expressed in terms of economic goods, and allowance made for the different marginal values which the same goods may possess to different individuals or at least to different communities. It is, of course, well known that wages statistics are not and, in the present state of our knowledge, cannot be expressed in this way. An approximation to it is, however, afforded by the method of correcting money wages by, or rather interpreting them in the light of, what is called the cost of living. Statistics of the cost of living of particular classes in certain countries are growing in volume, though they are still too inadequate to permit of anything like an exact interpretation and comparison of money wages in terms of "real" wages. The most important recent contributions to these statistics are, so far as I am aware, the reports by our Board of Trade on cost of living in British, French, and German towns,¹¹ while the United States Labour

¹⁰ "Report of an enquiry by the Board of Trade into working-class rents, housing, and retail prices, together with rates of wages in certain occupations in the principal industrial towns of France." [Cd-4512.] 1909.

¹¹ "Report of an enquiry by the Board of Trade into working-class rents, &c., in France." [Cd-4512], 1909; in Germany [Cd-4032], 1908; and in the United Kingdom [Cd-3864], 1908.

Department at Washington has issued valuable reports on cost of living in the States. From the Board of Trade reports referred to we find, *e.g.*, that while money wages in England, France, and Germany may be in the proportion of 100 : 75 : 83, such wages when interpreted in the light of the cost of fuel, rent and food in the respective countries, may be found to be in the ratio of 100 : 67 : 71. These figures may be but very rough approximations to the true level of "real" wages in the countries compared, but if the data on which they are based are fairly extensive or form a good sample from which to estimate the cost of living, they are much better than the level of money wages, and it is to be desired that authentic and detailed information on cost of living in all civilised countries may be collected and published.

But even with such additional information, the correct comparison of international wages statistics is impossible without a knowledge of the amount of unemployment experienced in different occupations in different countries. This knowledge is at present not obtained. The Trade Union unemployment figures published by the Board of Trade may reasonably be challenged, as they often are, as not affording an entirely complete statement of the amount of unemployment in this country. But such as they are, there are, I believe, no similarly extensive statistics in any other country comparable with them. The importance of unemployment as a social fact is undeniable, and every effort should be made to ascertain its real extent. This may be largely, if not wholly, accomplished by means of Trade Unions, Labour Exchanges, and Unemployment and other social insurance schemes. Until this information is forthcoming, it appears clear that wages statistics will not be capable of complete interpretation or of precise comparison.

An excellent example of the difficulty, or rather impossibility, of international comparisons, arising from radical differences in the things which it is sought to compare, is afforded by Savings Banks Deposits. In a recent publication intended to be largely used by platform orators the following "point" appears :—

Deposits in savings banks.

	United States. (Present Population 86,000,000.)	Prussia. (Present Population 37,000,000.)	United Kingdom. (Present Population 44,000,000.)
	Mill. £'s.	Mill. £'s.	Mill. £'s.
1875	185	50	68
'98.....	405	250	173
1907... ..	699	439 (year 1906)	210
Increase since 1875	514	389	142
Increase per cent. ...	278	778	209

From the second "Fiscal Blue-Book," already mentioned, it may be learned that Savings Bank deposits in the United Kingdom are limited to a maximum of 200*l.* in respect of any one person, while there is no limit for Registered Friendly Societies and certain other working-class societies. In Trustee Savings Banks the limit for individuals is the same as in the Post Office Savings Banks. In Prussia the maximum deposit varies from 25*l.* in some banks to 2,500*l.* in others. In the majority of the States of the American Union there is no limit at all to the deposits which an individual may make, while in the remaining States the maximum varies from 200*l.* to 1,000*l.* In view of these facts, comment on the extract quoted above would be superfluous. We have here essentially unlike things covered by a common name, Savings Banks Deposits. It is not a case of perfecting the collection and compilation of the statistics in order to permit of comparisons being made; it is a case of a radical alteration in the laws of the several countries respecting Savings Banks Deposits, or what may be called a case of organic change in the subject-matter of the statistics that is required to produce results properly comparable with one another.

It is unnecessary for me to discuss in detail other examples of the great difficulties of international statistical comparisons. Every important body of statistics will be found to yield examples. International statistics of occupations, industry, accidents, finance, armies, prices, strikes, population, and numerous other subjects will be found to suffer from one or more of the deficiencies named in the early part of this paper. As a final example, I may ask, what sort of comparison is possible between the fact that there were in the Russian Empire in 1906 39,000 miles of railway, and in the United Kingdom 23,000 miles? What is a mile of railway? A mile of single track, or double track, or what? And what is to be inferred from the statement that there were in 1906 in Chile 9·1 miles of railway per 10,000 inhabitants, and in the United Kingdom only 5·3 miles per 10,000 inhabitants? ¹²

In conclusion, I may repeat that my purpose in writing this paper was to exemplify, without exhausting the examples, from important bodies of international statistics the main difficulties encountered in any endeavour to make valid comparisons between one country and another. Some of the difficulties will disappear as the administrative machinery for collecting and compiling the statistics is perfected; some might be removed by international agreement on certain points of definition (including classification) and practice; but others seem insuperable without organic changes in the things subjected to statistical description, or

¹² "Statistical Abstract of the United States, 1907." Washington, 1908.

without additional information of a kind not yet collected, or collected only in isolated cases. But I submit the path of the inquirer would be very considerably smoothed if all official publications of international statistics contained full definitions of the statistical units dealt with, and a brief discussion of their differences. It cannot, I think, be seriously maintained that a statistical abstract is not the place for definitions and explanations, for which reference should be made to the original sources of the statistics "abstracted," supposing such sources to contain them. No table of figures should be published or quoted without that amount of definition and explanation which is essential to a correct interpretation and legitimate use of that table. Ten tables duly explained are better than fifty tables not explained. In our own official abstracts there is room for much improvement in this respect alone, and I could wish this Society could procure a full measure of improvement in the required direction.

DISCUSSION *on* MR. WEBB'S PAPER.

MR. A. W. FLUX said it was of the highest possible importance from time to time to emphasise the fact that figures which were quoted as if they represented the same class of phenomena did not really do so. But that did not necessarily justify the suggestion that every volume of official statistics should have an introduction discussing its contents. That depended on who had to use the statistics and on their main purpose, as well as on the volume of the necessary discussion. Those who did take the trouble to understand what the tables represented desired to see the latest figures added to tables, the nature of which they already understood. They did not want, and would ignore, an elaborate introduction of matter with which they were familiar. He did not in the least deny the importance of supplying adequate explanation as to the nature of official statistics; but it did not follow that every official publication was incomplete without an explanatory memorandum. It was very necessary sometimes, but rather dangerous, for the official Bureau of one country to print the statistics of another, yet not to print them as that country gave them. But, if he understood Mr. Webb aright in regard to the figures of United States trade, they could not meet the criticism he put forward unless the Board of Trade were to take the monthly summaries of trade and commerce of the United States and compile from them figures for the calendar year in order to replace the figures given for the United States fiscal

year. The student who desired for some particular purpose to compare the calendar years must be left to do something for himself. To re-arrange the figures of the United States in calendar years beyond what was already done by the United States authorities, was asking more than he would be inclined to regard as desirable. Others, however, might urge their friends in the United States to push for the extension of the calendar year surveys. He did not think a table setting forth the rates of freight charged on certain leading commodities would help substantially in providing the means by which the figures of imports and exports of different countries could be simply and quickly compared with one another. That kind of comparison could not be done quickly. Freight rates varied very much on different commodities and at different times of the year, and it was very hard to give figures which would be representative. Again, he did not think it should be assumed that the figures of trade, and of other departments of life, in different countries were set forth in one and the same volume side by side for the sole purpose of showing the comparative state of the welfare of the countries in question. Many tables would be more useful as a means of watching the progress in each country by itself rather than of measuring the difference of level in the various countries, which was becoming increasingly difficult to estimate. He agreed entirely that if official returns gave figures, for example, relating to shipping, in which the mode of measuring tonnage was the same for different countries, and in which the ships included had the same limit, it would be an improvement; but he could not quite agree that because some included and others excluded ships under five tons, and others ships of even larger measurement, therefore they could not be put into relation with one another. It depended upon whether the aggregate tonnage of these small ships amounted to a substantial proportion of the whole. The difficulties as to the modes of measurement were serious. So far as the United States was concerned, the fact that the vessels on the register were only recorded in gross tons was a difficulty in comparing with a country which used net tons, just as the Belgian net ton was a difficulty in similar comparisons. Those who dealt much in tonnage certainly got a general idea of the approximate differences involved. But he would be sorry to have to suggest a co-efficient, or a means by which one could be compiled, for giving even for rough purposes the equivalent of gross tons in terms of net tons. Such a factor of conversion would serve well enough for some purposes, but would be very misleading for others.

Dr. DUDFIELD said that, with regard to the paragraphs dealing with vital statistics, the first point raised referred to the variety of classification and to different diagnoses which doctors made in similar cases. It appeared to him to be hopeless to expect different medical men always to arrive at an identical diagnosis of a given case, having regard to the more or less incomplete data for such diagnosis—except when a complete *post mortem* examination was made. At the same time he must admit that there was a

considerable element of "fashion" in naming complaints. Nine or ten years ago there was an epidemic of influenza, and since then the disease had always prevailed. But he had little doubt that the term "influenza" was used to cover cases of disease not adequately diagnosed. On the question of international agreement, Mr. Webb probably had in his mind that that was provided for by the Bertillon classification, which had been adopted in Europe and America, but not in this country. The Registrar-General made use of a schedule of causes of death, which was a modification of that drawn up by the late Dr. Farr, and even in its present form not in agreement with the international schedule. It was unfortunate that this country was not represented on the International Committee. The main question he wished to speak to was that of infantile mortality. Mr. Webb had said it was not unlikely that the recorded increase in infantile mortality in the United Kingdom during the closing decades of last century had been largely due to the fact that fewer infants dying within a few days of birth were described as "still-born," and thus were not included among the registered births. Another, and very different, explanation could be put forward. In the closing years of the last century the vaccination question was very prominently before the public. From experience in his own district he knew that a certain proportion of births were not registered, simply to escape the attentions of the vaccination officials. He had found, from time to time, children whose deaths had been registered, but of whose birth he had not been able to trace the registration, although, to his knowledge, the parents had lived from the birth to the death of the children in the district. Again, Mr. Webb had referred to the extreme diversity that existed in the definition of the term "stillborn." The definition of what was a "stillbirth" did not seem to him (Dr. Dudfield) to be of so much importance as the question of the proper way of dealing with stillbirths in statistics. He had recently read a somewhat lengthy monograph on Infantile Mortality in Alexandria, in which comparisons were made between the local rates and those prevailing in England. He found that the Alexandrian figures included the stillborn among the births, which was not the practice in this country, and that the mortality-rates were calculated on the totals of livebirths and stillbirths. When the proper corrections were made, to accord with English practice, the Alexandrian figures were very much worse than they appeared in the first instance. If, as in some continental statistics, the stillbirths are used for calculating the birth-rates, they should be included among the deaths; that is, they should be counted twice over—as births and deaths—in calculating infantile mortality-rates. But that was not done in some of the statistics he had studied, with the result that the mortality figures understated the facts. It would appear from that portion of Mr. Webb's paper that in this country no progress was being made in the collection of statistics relating to births and stillbirths. It was said that stillbirths were not registered. They had not been, and were not, registered, except occasionally by accident; but, under the Notification of Births Act, 1907, stillbirths were now taken into

account. The births of all children, living or dead, were now notified to the medical officers of health of districts in which the Act had been adopted. Such notification was required in every case in which the pregnancy had lasted twenty-eight weeks. There would in the future be some very fair figures to work upon. Again, Mr. Webb had asked whether it was too much to expect that an international assembly of the medical profession should agree on what was a stillbirth. He thought it was a question in the first place for the legal, not the medical, profession. He did not know that lawyers quite knew; but they had a working definition, which was that a child was stillborn if it had no life independent of the mother—if it was dead before the cord was separated; but, if the cord was separated, and the child showed any life, no matter how short, it was liveborn. He believed that even if the child made any cry before the cord was separated it was sufficient. From a demographical point of view there was a class of birth which, while actually “livebirth,” was in effect no better than a “stillbirth.” He referred to those children who, while born alive, were doomed to early death from ante-natal or other causes. Such births he was in the habit of styling “hopeless births.” They were what Bertillon *père* called “*frustra-nés*.” In his opinion the question requiring to be decided internationally was, not what was a stillbirth, but how stillbirths were to be dealt with in calculating infantile mortality. Such an agreement was requisite for international comparisons.

Mr. REW said this subject was one which had frequently engaged attention, and he need hardly remind the Society that the International Statistical Institute in particular had been working hard for twenty-five years in endeavouring to deal with many of the questions now raised, and had in fact been able to effect considerable improvement in comparative international statistics. Still, a paper of this kind was very useful even to those most familiar with the difficulties mentioned. It was well for the most hardened of them occasionally to have ideals put forward, and he thought the author had a somewhat high statistical ideal. Perhaps after a time, like some of them, though he might still cherish his ideal, he would feel less sanguine of attaining it. He sometimes thought, with regard to those questions, that they were apt to dream of a statistical millenium, but for himself he feared he would have made his last contribution to statistics by adding a unit to the death returns before that time arrived. One point in the paper concerned his own department, and he would mention it, as it elucidated some of the difficulties which arose in discussions of this nature. Mr. Webb quite legitimately pointed out a difficulty with regard to the conversion of the returns of the production of oats in Germany. He referred to the Board of Agriculture statistics of 1906, though the same point might also arise in a later year. He did not, however, mention what was somewhat relevant, that in the table given for Germany in the return the conversion of metric tons was made directly into hundredweights. At the end of the return they gave

a table in which was put down a figure for the oat crop for every country which supplied the information, and as some countries persisted in returning by weight and some by measure, it was obvious that they must take some factor of conversion from weight to measure in certain cases. The system adopted was to convert by what was the well-known general rate of 39 lbs. per bushel in the case of oats. This rate was used in the Trade and Navigation Accounts by the Board of Trade, as well as in the returns of his department. He did not quite see why a comparison made by adopting an uniform rate of conversion was not good for the purpose for which it was put forward. Even if it were possible, which it was not, to convert all bushels in foreign countries at the natural weight of the bushel in those countries, he was not at all sure that the comparison would be much better. He thanked the reader for his paper, which was a very useful contribution to their proceedings.

Mr. WEBB said the chief person to whom he had to reply was Mr. Flux, as Dr. Dudfield and Mr. Rew were more or less in agreement with him, though they suggested that he was aiming at statistical ideals. He could not agree with Mr. Flux when he said he did not think it was desirable that every official publication should contain an adequate explanation of the matter contained in it. He did not think it was a sufficient answer to say that persons using those publications were presumed to know their contents. He did not think that was the case, or that the Government departments should assume that it was the case, especially in view of the very wide attention now being given to all statistical matters and the large demands made by all sections of the public for statistical information respecting not only this country, but all countries. He agreed with Mr. Flux that figures given in publications dealing with foreign countries, so far as they were considered in relation to the particular country to which they referred, gave an excellent idea of the dynamic changes going on in those countries; but they wanted some means of comparing one country with another, and, since official sources afforded the greater part of the information, it seemed desirable that no Government department should publish books without an adequate explanation of what the things were with which they had to deal. He urged that because of the great attention now being directed to all statistical compilations, and it was necessary they should be able to carry out statistical comparisons legitimately and without making the blunders which were every day being made for want of such explanation.

The CHAIRMAN said, having been dealing with international statistics for about thirty years, he agreed with a great deal of what had been said.

On the DISTRIBUTION of DEATHS with AGE when the CAUSES of DEATH ACT CUMULATIVELY, and SIMILAR FREQUENCY DISTRIBUTIONS.

By G. UDNY YULE.

[Read before the Royal Statistical Society, December 14, 1909.]

THE problem considered in the following pages was suggested, not by any statistics of deaths amongst mankind, but by a recent memoir on the law of mortality for bacteria subjected to the action of a disinfectant.* I consider, however, a law of mortality that the bacteria do *not* follow, and the results arrived at appear to be possibly of some interest as regards the theory of mortality in man and also the theory of frequency in general.

In the memoir to which I have referred, Miss H. Chick shows that bacteria immersed in a disinfectant follow, approximately at least, the law of mortality

$$l_x = l_0 \cdot e^{-c \cdot x} \quad (1)$$

l_0 and l_x being the number at the commencement of the experiment and surviving at time x respectively, and c being a constant for the given bacteria and disinfecting solution. With this logarithmic law the rate of mortality is constant throughout the experiment—precisely the same at the end as at the beginning. Now such a constancy of the death-rate appears somewhat remarkable. On the one hand it seems to exclude any selective action of the disinfectant, seeing that if the death-rate were selective the mortality might be expected to decrease as the weaklings were weeded out. On the other hand, it seems equally to exclude any gradual or cumulative action of the disinfectant, seeing that if the action were gradually cumulative the death-rate might be expected to increase more or less slowly from zero or from some low initial value. Both factors—selection and accumulative action—might, of course, act together, but they could hardly balance save exceptionally.

While cumulative action thus appears, on general grounds, to be excluded, it still seems an interesting question to ask, what would be the exact form of the law of mortality if the action of the disinfectant were cumulative, the individual bacteria exposed to its effects being all generally similar, so as to exclude selection? This is the problem of the present note.

* "An investigation of the laws of disinfection," by Harriette Chick, D.Sc. *Journal of Hygiene*, viii (1908), p. 92.

If all the individuals were absolutely identical and also the circumstances precisely the same for each, evidently all would die at the same moment when the action of the disinfectant reached its fatal limit. This never occurs, even under experimental conditions, so that if all individuals are to be assumed similar, some element of chance must be assumed to enter into the circumstances. Let us suppose it to occur as follows. The individuals are exposed to the disinfectant during 1, 2, 3 . . . units of time, which may be regarded as a series of successive exposures to risk. For each individual any one exposure may be either favourable (nothing happening to it) or unfavourable (*e.g.* a molecule of the disinfectant entering into combination with the substance of the bacterial cell): r such unfavourable exposures, let us suppose, are in every case fatal, and the chance of any one exposure being unfavourable to any one individual is p . Such assumptions, though we speak of bacteria, are not very unlike those that might perhaps be made in certain cases for man, the "unfavourable exposures" representing those minor illnesses or inefficient infections from which he may at first easily recover, but each of which may leave some trace that will render recovery from the next more difficult. A similar chain of cumulative causation may be assumed, too, to be operative in other cases in which we are not concerned with mortality at all, but with events of quite a different character. The applications of the problem are, then, by no means so limited as its statement for the special case might suggest.

Consider then the proportion of individuals which will have received 0, 1, 2, 3, . . . unfavourable exposures at the conclusion of the n^{th} exposure, the individuals being regarded as exposed indefinitely. Evidently this is the same thing as the proportion of cases in which 0, 1, 2, 3, . . . successes will have been registered out of n events when the chance of a success is p , and the answer is given by the terms of the binomial series

$$q^n, \quad n \cdot q^{n-1}p, \quad \frac{n(n-1)}{1 \cdot 2} q^{n-2} \cdot p^2 \dots \quad (2)$$

If r unfavourable exposures be fatal, the total proportion of survivors at the end of this n^{th} exposure will be given by the sum of the first r terms of this series. Similarly the total proportion of survivors at the end of the $(n-1)^{\text{th}}$ exposure will be given by the sum of the first r terms of the series

$$q^{n-1}, \quad (n-1) \cdot q^{n-2} \cdot p, \quad \frac{(n-1)(n-2)}{1 \cdot 2} q^{n-3} p^2 \dots \quad (3)$$

The proportion of the original population dying during the n^{th} exposure is therefore the difference between the first r terms of (3)

and the first r terms of (2). If these be worked out and reduced to their simplest forms they will be found to run

$$q^{n-1} \cdot p, (n-1)q^{n-2} \cdot p^2, \frac{(n-1)(n-2)}{1 \cdot 2} q^{n-3} \cdot p^3 \dots$$

This series is the binomial expansion of $p(q+p)^{n-1}$ and the general term is

$$\frac{(n-1)(n-2) \dots (n-r+1)}{1 \cdot 2 \cdot 3 \dots (r-1)} q^{n-r} \cdot p^r.$$

Writing out the values of this general term for values of n from r onwards, seeing that deaths cannot commence till the r^{th} exposure if r unfavourable exposures is the minimum which is fatal, we have the series

$$p^r, \quad r \cdot p^r \cdot q, \quad \frac{r(r+1)}{1 \cdot 2} p^r q^2, \dots \quad (4)$$

But this is the binomial expansion of $p^r (1-q)^{-r}$, and we have therefore reached the law that *the proportions of the original population dying during the successive exposures, if r unfavourable exposures are fatal, are given by the successive terms of the binomial expansion of $p^r (1-q)^{-r}$, the first deaths occurring, of course, at the r^{th} exposure.* If $r=1$, that is if the causes of death are not cumulative, we get the geometric series for the deaths occurring at each exposure, viz.:

$$p, \quad p \cdot q, \quad p \cdot q^2 \dots$$

which is equivalent to the law of survival found by Miss Chick. But if r be greater than unity, the number of deaths per exposure rises more or less gradually to a maximum and then falls more slowly than it rose, as the population initially exposed to risk is killed off. The rate of mortality, given by the ratio of the n^{th} to the sum of the n^{th} and following terms, rises continuously, but I cannot give a general expression for it. If we reckon individuals who die during the n^{th} exposure as dying at time $n-0.5$, the mean age at death M and the standard deviation σ are given by the equations

$$M = \frac{r}{p} - 0.5, \quad \sigma^2 = \frac{r \cdot q}{p^2} \quad (5)$$

whence p and r are readily determinable from a given distribution for which the time of commencement of exposure to risk is known.

But in most practical cases the distribution of deaths will not be discontinuous in the way in which we have pictured it for the sake of the foregoing investigation. It is of interest, therefore, to find a continuous frequency-curve, the area of which, between the ordinates corresponding to any two times x_1 and x_2 , will give the deaths during that period. As our discontinuous series is a binomial series, the form of curve to which we will pass will evidently be the binomial curve of Professor Pearson (type iii

of his memoir*), though he derived it from a binomial series with positive and not with negative index.

Let y_{n+1} and y_n be the terms of the series (4) for the $(n+1)^{th}$ and n^{th} exposures respectively, then, following Professor Pearson's method, we find

$$\frac{y_{n+1} - y_n}{\frac{1}{2}(y_{n+1} + y_n)} = \frac{2(r-1-pn)}{n(2-p) - (r-1)}.$$

Now suppose the chance of an exposure during a short time, t being unfavourable to be $c \cdot t$; then, replacing the number of exposures n by x/t , we may write the preceding expression

$$\frac{\Delta y}{y \cdot t} = \frac{2(r-1-cx)}{2x - px - (r-1)t}.$$

If now t become indefinitely small, and consequently p also, we may replace t by dx on the left, and neglect the terms involving t or p on the right, whence

$$\frac{dy}{y \cdot dx} = \frac{r-1-cx}{x}.$$

That is, integrating,

$$y = y_0 \cdot e^{-c \cdot x} \cdot x^{r-1}. \quad (6)$$

The principal functions of this curve are as follows :

$$y_0 = \frac{N \cdot c^r}{\Gamma(r)} \quad (a)$$

$$M = \frac{r}{c} \quad (b)$$

$$\mu_2 = \sigma^2 = \frac{r}{c^2} \quad (c) \quad (7)$$

$$\mu_3 = \frac{2 \cdot r}{c^3} \quad (d)$$

$$\text{Mode} = \frac{r-1}{c} \quad (e)$$

The mean age at death is always slightly greater than the modal age, the longer tail of the distribution extending towards old age. If the time of commencement of exposure to risk is known, the mean and standard deviation alone suffice to give the constants c , which measures the chance of an unfavourable result accruing during exposure for unit time, and r which measures the number of unfavourable exposure necessary to ensure death. If the time of commencement of exposure be not known, the standard deviation and third moment coefficient μ_3 must be used to determine c and r : r/c is then the time, since exposure to risk began, at the epoch of the mean age at death M . The appearance of the curve at the commencement of exposure varies considerably with the value

* "Skew variation in homogeneous material." *Phil. Trans. (A)*, vol. 186 (1895), p. 393.

of r . If r be greater than 2 the curve rises gradually, starting tangential to the base: if r is exactly 2, the curve may rise at any angle: if r lie between 1 and 2, the curve rises abruptly at right angles to the base: if r is equal to 1, the maximum ordinate is at the commencement of exposure, the curve becoming of the logarithmic form (1). If r is less than 1 the ordinate at the commencement becomes infinite, but it would not seem possible to assign any physical meaning to such a case, as the initial population could not be indefinitely large, nor could less than one unfavourable exposure be fatal.

In arriving at the expression (6) we have assumed, it must be remembered, that we start with a single population, which we follow throughout life, and that this population is subjected to the one class of causes of death only, all individuals dying the same death. In no actual case, outside experiment, do these conditions hold good, and in the experimental case, unfortunately for the sake of illustration, the law of mortality assumed its simplest shape, $r = 1$. It may be considered then rather surprising if the law does hold for any distribution of ages of death, in any case in which the numbers are disturbed by the fact that we are not dealing with a stationary population, nor with a population subject to one cause of death only. I have taken the following illustrations, in full recognition of the deficiencies of the material for the present purpose, in the hope merely that they may give roughly approximate values of r , and indicate to those competent to judge, whether the assumption on which the formula has been based is at all worthy of consideration as a working hypothesis to account for the age-distributions of the diseases in question.

I. *Enteric fever*.—This case was suggested by one illustration in Professor Pearson's memoir,* in which he fits the age-distribution of 8,689 cases in the Metropolitan Asylums Board's Hospitals (ages at admission) with a curve of the type (6). He finds for the constants $c = 0.214$, $r = 4.67$, the year being taken as unit. He fits the curve by the use of the second and third moments, and finds an origin (time of commencement of exposure) somewhat before birth, but only 9 antenatal cases given by the theoretical curve. Hospital data were, however, as it seemed to me (though in this I may have been mistaken) unsuitable for the present purpose, as they might represent a population selected as to age, the lower ages not being fully represented. I therefore thought it better to take the age-distribution of deaths for the whole population. This distribution is shown in fig. 1 by the stepped line, the data being taken from the last decennial supplement of the Registrar-General (p. 3). Clearly one curve will

* *Loc. cit.*, example VI, fig 9.

not suffice to describe this distribution ; there is quite a marked hump in the distribution between the ages of five and ten. This suggests a certain amount of childhood mortality of a special type, possibly

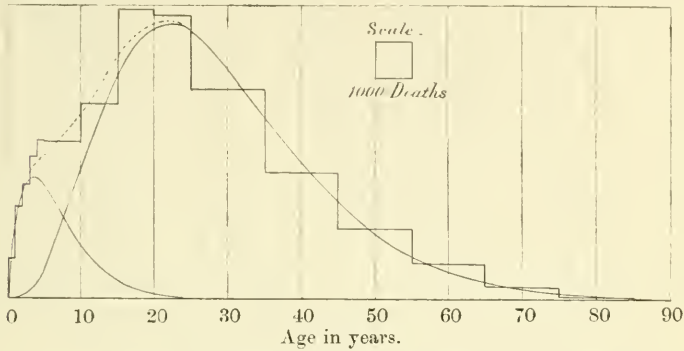


FIG. 1.—*Number of deaths from enteric fever at different ages.*

not really enteric fever at all, superposed on the general mortality which gives the greatest numbers of deaths during the quinquennia 15—20 and 20—25. I estimated the constants of the curve for this childhood mortality from the numbers of deaths in the first three years of life and found the small curve on the left of the diagram. Subtracting the deaths included in this curve from the remainder, I got a distribution freed from the childhood mortality, and determined its constants from the mean and standard deviation. The following are the principal constants of the two curves. The constants for the “after-life” distribution of deaths are, it will be noticed, not very different from those given by Pearson for the ages on admission of the M.A.B. hospital cases ($c = 0\cdot21$, $r = 4\cdot67$).

	Distribution for	
	Childhood,	After-life.
c	0·29	0·14
r	2·02	4·16
Number of deaths	6,220	47,180

Now the curve given by the combination of these two is by no means a close fit to the actual distribution, the numbers of deaths between 15 and 25 being considerably in defect as compared with those recorded, between 25 and 45 in excess and between 45 and 65 again in defect, but it certainly does reproduce the main features of the distribution, and, as stated above, we ought not to expect a good fit. Fitting, moreover, under the conditions of this case, is more or less of a guesswork process, and it is possible that some

time spent on various trials might result in the obtaining of a better-fitting curve. However this may be, I wish to pose the question whether the causation of enteric fever can be regarded, in the manner suggested by these results, as in any sense cumulative? The constants suggest that for the type prevalent in childhood 2 "unfavourable exposures"—infections, I take it—are on the average required to produce death; for those who survive the period of childhood, 4: the infections, if one may regard them as such, acting cumulatively. If this might be assumed, the fact of the greatest incidence of the disease occurring about ages 15–20 when the organism is in full vigour, an incidence which otherwise seems rather a puzzle, would be accounted for. It may be noted that, in these cases, it is difficult to assign a very definite meaning to c ; it is not the chance of any individual, but merely of any one of those individuals who will ultimately die of enteric fever receiving an "unfavourable exposure" during the year.

II. *Phthisis*.—I attempted to analyse in the same way the distribution of deaths for phthisis. There are again two components in this case, but they are much more clearly separated, *cf.* fig. 2. The small component represents mortality of infancy rather than of childhood, and I understand that it is doubtful if many of these cases are really phthisical at all. In order to obtain anything like a fit to the infantile distribution, I had to carry the origin back in the same way that Professor Pearson found necessary in other cases, to nine months before birth. Evidently the compound curve, fig. 2,

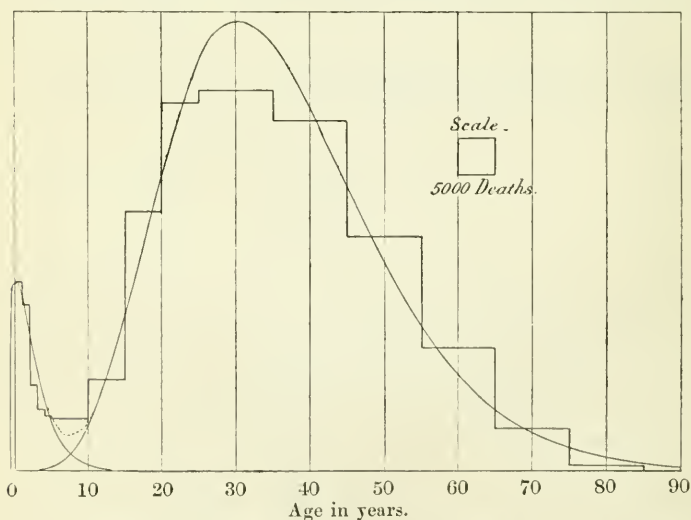


FIG. 2.—*Number of deaths from phthisis at different ages: first fitting.*

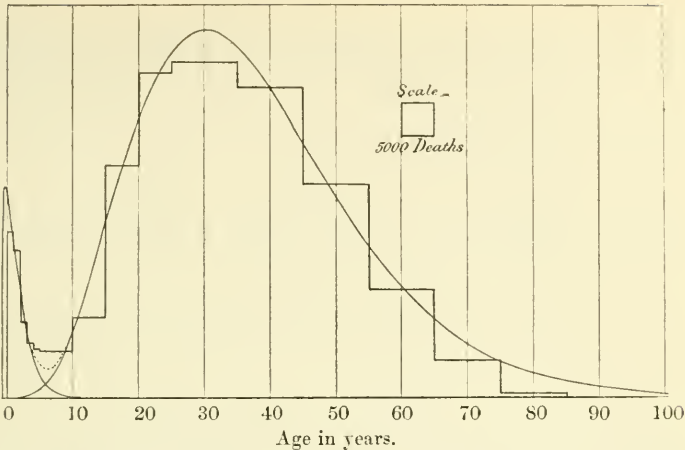


FIG. 3.—*Number of deaths from phthisis at different ages: second fitting.*

is distinctly a worse fit than in the case of enteric fever, the greatest divergence occurring in the age-group 25—35, where the deaths given by the theoretical curve are some 15 per cent. in excess. I also give in Fig. 3 the results of another attempt at fitting, in which I endeavoured to carry the curve near the greater part of the contour of the principal component, renouncing any endeavour to make the area of the curve equal to that of the stepped line. The general fit is distinctly better, but it will be seen that the curve gives a very large excess of deaths in old age. This indicates, I think, the source of the difficulty; the deaths from phthisis from age 65 onwards are very much in defect, presumably because the individual is likely to die of old age before he gets a fair chance of dying of phthisis, and hence it becomes impossible to get a reasonable fit by the use of the standard deviation. The same difficulty is operative, though to a less extent, in the case of enteric fever. The following are the constants found in the two different guesses at fitting :—

Distribution for		
	Infancy.	After-life.
c	0.46	0.171
	0.60	0.131
r	1.46	6.19
	1.49	4.94
Approximate number of deaths, { (1) {	a.n. 2,300	—
distinguishing ante- and post- {	p.n. 16,200	410,000
natal deaths in infancy { (2) {	a.n. 4,230	—
	p.n. 16,180	436,500

The numbers obtained for r are not very discordant considering the roughness of the estimate and the unsuitability of the material. In the case of infantile phthisis, or the causes of death returned as such, the results suggest, either 1 or 2 "unfavourable exposures" or infections are usually fatal: while in the case of those who survive infancy, 5 or 6 are needed for a fatal result. Again, as in the last case, if such repeated and cumulative infection be a *real* factor it will account for the otherwise curious incidence of the disease during the prime of life. The assumption would seem also to be in accord with the length of the period of latency which phthisis often presents. It should be noted that if the assumption be essentially correct, the period during which the mortality from phthisis is greatest cannot correctly be termed, as it sometimes is termed, the "danger zone," nor should it be regarded as such; on the present assumption, the whole of life is equally dangerous, and the number of deaths rises merely because the causes act cumulatively.

It should be added that both in this illustration and in the preceding I have, perhaps, added to my difficulties by taking the distributions for the two sexes together; they should certainly have been considered separately.

III. *Divorces*.—As I mentioned at the commencement of this note, the same law of distribution will, of course, apply in any case other than that of mortality where the causes act cumulatively, and an illustration can again be cited from Professor Pearson's memoir,* namely, the distribution of divorces with duration of marriage in the United States. Unfortunately, however, the original table did not give the distribution beyond a duration of 20 years, and as some 8.5 per cent. of all the divorces were obtained after this duration the defect is rather serious. Distributing these divorces as he judged best, Professor Pearson calculated the second and third moments and thence determined the constants, the origin so determined being at 0.47 of a year after marriage. The commencement of "exposure to risk" is, however, the date of marriage, and it would seem better to assume this. Further, I should myself have estimated the standard deviation at a lower value than that taken by Professor Pearson. I give below the three sets of constants for this distribution, as given by Pearson, as determined from the mean and standard deviation which he gives, and as determined from my own estimates of the mean and standard deviation respectively. I also give the constants for some more recent data,† in which I only had to estimate the distribution after a duration of forty years;

* *Loc. cit.*, example IX, fig. 12.

† "Marriage and Divorce, 1867-1906." Part 1. Summary, laws, foreign statistics. 4to. 1909. (United States Census Bureau Special Report.)

at the same time the exact meaning of the figures as to duration is by no means clear to me, and this affects the results.

	Constant	
	c.	r.
<i>Divorces, U.S.A., 1882-86.</i>		
Karl Pearson, <i>loc. cit.</i>	0.150	1.369
Using mean and standard deviation only	0.158	1.514
My own estimate of mean and standard deviation ...	0.168	1.499
<i>Divorces, U.S.A., 1906.</i>		
My own estimate of mean and standard deviation	0.163	1.680

Interpreting these constants in the light of the theory on which the curve is based, we may say that the causation of divorce is cumulative, as one might expect, that one to two matrimonial differences ("unfavourable exposures") usually suffice to determine a "fatal result," and that the chance of such a difference occurring in any given period is—of course, for these marriages only which will ultimately be severed by divorce—at the rate of about 0.15 to 0.17 per annum. Of course, these divorce statistics really suffer from precisely the same defects as the mortality statistics, for our present problem, as they are not based on a stationary population and marriages are terminated by death as well as by divorce.

These distributions, it may be added, as I have tested, can be fitted very well by a binomial distribution with negative index of the type (4), taking the year as the unit for the successive terms. They cannot be fitted at all by an ordinary binomial series.

DISCUSSION on MR. YULE'S PAPER.

DR. DUDFIELD said he had read this Paper with great pleasure, inasmuch as it gave him something to ponder on. He thought that those members of the medical profession who chanced to read the Paper and could follow the mathematics, which he could not do entirely, would find food for reflection. There were one or two points which he thought should be discussed. In the first place it was unfortunate that the formula to which Mr. Yule had referred was that given by Miss Chick for sporing bacilli only. There were two kinds of bacilli—sporing and non-sporing. Non-sporing

bacilli had no protection against any unfavourable exposure, except their vitality: the sporing bacilli, when subjected to conditions unfavourable to continued propagation, took on the spore stage, and were then able to survive treatment to which they would succumb in the other stage. In the ordinary practice of steam disinfection it was the sporing bacilli which gave most trouble. A single exposure to steam, unless at such a high temperature as to damage the goods, could not be relied on to sterilise them. To destroy the bacilli the temperature required to be raised and lowered two or three or more times. It seemed to him, therefore, that sporing bacilli were much more favourably situated than mankind in the struggle to overcome "unfavourable exposures," to use Mr. Yule's own term. Mr. Yule's formula 6, on p. 29, appeared to him (Dr. Dudfield) closely to resemble the formula which Miss Chick obtained for the non-sporing bacilli. He was unable to agree with the author in his choice of statistics of enteric fever in rejecting hospital returns in favour of those issued by the Registrar-General. He had rejected the statistics which were the least likely to be affected by errors of diagnosis. This view was, he thought, supported by the fact that Mr. Yule had been obliged to construct two distinct curves. Young children—certainly those under 1 year, and probably those under 5 years of age—very rarely died of enteric fever, unless the disease were epidemic, owing to polluted water or milk. The mortality represented by the first of the two curves was, in his opinion, due to disease, or diseases, other than enteric fever. One disease in particular was frequently confused in general practice (not in hospitals) with enteric fever, namely, tuberculous disease of the intestines or the brain. Again, he must take exception to the phrase that "the constants suggested that for the type prevalent in childhood two unfavourable exposures were necessary." He hoped Mr. Yule had not formed the idea that man was a test-tube, and that, given an invasion of the bacillus, the disease was bound to follow. It was quite otherwise. Other factors required to be operative in the body before the bacilli could become effective in producing the disease. It was in this connection that he experienced a difficulty in reconciling what seemed otherwise probable in Mr. Yule's work. A single infection or dose of bacilli might prove fatal; but, as regards tuberculosis at least, if not many other diseases, many doses might be taken during life, not only without fatal issue, but without even any manifestation of disease. He was perfectly certain that during his life he had swallowed many doses of the tuberculosis bacillus, and he was almost equally confident that there was not a trace of that disease in him. He had received cumulative doses, but nothing had happened, and hence he had considerable difficulty in accepting the cumulative theory put forward by the author, although it looked convincing from the mathematical side. With regard to the theoretical deficiency in mortality from phthisis at the older ages, he thought the explanation that old people died from other causes before they became consumptive was based on a misconception. The maximum in the mortality-curve from phthisis was somewhere between 25 and 50. The majority

of those who were doomed to die of phthisis died before they reached 65. Those who lived to 65 and over represented those (a small proportion of the susceptible individuals only) who had passed unscathed through the danger zone of the younger life, but succumbed in old age to the disease. Some figures he had taken out quite recently suggested that at ages of 65 to 70 years there had been some increase during the last few years in the mortality from that disease.

Mr. YULE said Dr. Dudfield had made just the sort of remarks he, not being a medical man, had hoped for. He had, indeed, put forward some of his suggestions with a great deal of trepidation. Still he had borne in mind that man was not a test-tube, and he had understood that one might get infection in a sense of the term without subsequently getting the disease; and it occurred to him that in the case of phthisis, where apparently one did get a slightly efficient infection without getting very ill, subsequent infections might be more dangerous.

Dr. DUDFIELD said that possibly a person might have tubercular disease and not show a sign of it all his life; it might only be discovered after death.

Mr. YULE said that possibly a man who had suppressed tuberculosis of that kind might be more liable to a severe attack on getting a second dose. He quite recognised that he might have been ill-advised to take the ordinary returns of deaths instead of the hospital returns.

Dr. GREENWOOD asked if Mr. Yule had considered whether cumulative infection always increased the chances of death. Might it not be that it diminished them to a certain point and then increased them?

Mr. YULE said he had not considered any more complex question of that kind. He quite recognised that his formula represented a mere average result, and that there might be some individuals who were practically immune, whilst others might require one or two doses. Dr. Dudfield suggested to him some days ago that his law looked like the second law which Miss Chick found to hold for non-sporing bacilli. He had looked into that, and it appeared to him that it was not so. The law Miss Chick got for non-sporing bacilli would give numbers of survivors and deaths, varying inversely as a power of the time. One would not get any maximum in the number of deaths, and the second law of Miss Chick's memoir probably corresponded to the case of selection.

Dr. DUDFIELD, with reference to the question as to frequent doses first decreasing and afterwards increasing the chance of death, said that was the general law of infection. A small dose (say) of a specific infection would confer a certain degree of immunity, but

not sufficient to avert a fatal issue following a massive dose of the same infection. It might be possible to develop that point and to study the case, to determine, if possible, the point at which the immunity conferred by minimal doses ceased to be protective against the effects of maximal doses.

Mr. YULE said this point was most important, but he thought his mathematics would not suffice to deal with it.

The following were elected Fellows of the Society :—

Clark, Albert Hawkins, A.M.I.C.E.	Osborne, James Henry, F.R.G.S.
Gaskell, Thomas Penn, M. Inst. C.E.	Sharp, Clifford Dyce.
Heath, John St. George Currie.	Verney, Harry, B.Sc., B. Comm., LL.B.
Hobson, Charles Kennett.	Wilbur, Dr. Cressy L.
Lubbock, Hon. Harold Fox Pitt.	Williams, Sydney Fairs.
Nathan, Eric Barnett, A.I.A.	

MISCELLANEA.

The Statistics of Wages in the United Kingdom during the Nineteenth Century. (Part XV.) *The Cotton Industry.* Section I. By GEORGE HENRY WOOD, F.S.S.

WITH the exception of agriculture, probably no industry has been so extensively investigated and written about as the cotton industry. Nor is this surprising when we realise the enormous expansion caused by the invention of machine methods of production, the sudden growth of the factory system and all its early horrors, the struggles for the Factory Acts, the diversity of employments and methods of payment, and the present structure of collective bargaining with its elaborate price lists and agreements, grown up from very small beginnings.

The constant attraction which the cotton industry has had for the investigator makes our task of measuring throughout a century the variations in the wages of its operatives possible, but by reason of its abundance and diffuseness, adds greatly to the difficulty of the enterprise. True, the industry is easier to study than, say, the coal and iron industries, because it is more localised. For all practical purposes there were never more than three distinct centres of the trade; to-day we can practically afford to ignore all the work done outside of Lancashire and the counties on its borders. On the other hand, the gradual redistribution of the trade inside the Lancashire area, and the continuous changes of methods and *personnel*, introduce problems which almost baffle the statistical historian, and for which only approximate solutions may be offered. Some part of our work will always be dependent on "educated guesses."

From the earliest days of the modern form of the industry piece price lists have been in vogue, but these were generally applicable to single mills, and the methods of computing wages for similar or identical work varied from mill to mill. Then came a certain amount of uniformity by the adoption of lists for local areas, like the Manchester list of 1831 (hand mules), the Bolton spinning list of 1844 (hand mules), the Preston spinning lists of 1853 and 1859, the Blackburn spinning and weaving lists of 1853, and the large number of spinning lists of the period 1866-67. By a kind of survival of the fittest, most of these local lists have been superseded, and to-day the bulk of the industry is carried on under the following lists:—

- 1892. Uniform weaving list.
- 1876. Oldham self-actor spinning list.
- 1858. Bolton self-actor spinning list.
- 1860. Ashton self-actor spinning list.
- 1907. Universal list for frames.
- 1903. Universal list for revolving flat cards.

The Preston spinning list of 1859, revised, 1866, the Blackburn

spinning list of 1853, and the Burnley spinning list of 1867 are still in vogue, as is also the original Blackburn weaving list of 1853, which gave way generally to the uniform list in 1892, but is still used in some mills. In each case, except the universal lists for frames and cards, these lists have, from time to time, been modified to meet new conditions, or added to in provision for payment for extra or new kinds of work.

These and other lists may be studied in the reports of the Committee of the British Association on the Regulation of Wages by means of lists in the Cotton Industry, 1887, and the report of the Labour Department on Standard Piece Rates of Wages and Sliding Scales, Cd-144, 1900.

In addition to the changes in the principal piece lists, we have been successful in obtaining statements from various firms of the changes in the levels of the special piece lists or standard wages in their own mills. Where these have followed exactly the changes in recognised standard lists operative in their particular district, the variations are not printed, but where the firms in question have made advances or reductions which have not been general in the locality, their successive changes are given in Table 1, which shows the level of piece prices or time wages at the end of each year when the original starting point = 100.

This table commences with the foundation of the earliest list that is still to be found in operation. It may be noticed, however, there were reductions in 1847 of 10 per cent., and advances in 1853 of 10 per cent., which were nearly general throughout Lancashire. During 1871-75, too, we find many references in contemporary labour and local newspapers to advances to piecers, strippers and grinders and others. Some of these will be mentioned later in connection with tabulated statements for various districts.

The relation of these changes in standard price list levels to changes in the actual earnings of operatives whose wages they regulate will be discussed at a later stage.

As the hours of labour are regulated by the Factories and Workshops Acts, it will be useful to state the usual hours worked at various periods throughout the century. In 1795 they are said to have been "not infrequently 80 in the week."¹ From 1810 to 1825 they appear to have been 12 per day and 72 per week, and from 1826 to 1846, 69 per week. In 1847, the "Ten Hours" Act was passed, and the hours for young persons and women were fixed at 63 from July 1, 1847, and 58 from July 1, 1848. In 1850, another Act made these hours 60 weekly, and in 1853 the Acts were applied to "children." As no normal day was fixed for children until 1853—though a normal day was fixed for young persons and women in 1850—the Acts of 1847 and 1850 were evaded by the use of relays of operatives, and investigation indicates that 60 hours were usually worked from 1848 onwards. The trade was so depressed, however, in 1847-48, that any statutory duration of the normal week was only hypothetical, for very little full time was worked in Lancashire during this period. From 1853 until

¹ *A century of fine cotton spinning*, p. 54.

Blackburn and Uniform weaving lists.	Oldham spinning list.	Bolton (self-actor) spinning list.	Ashton spinning list.	Preston spinning list.	A private firm in the North and North-East Lancashire Association's district.				Oldham private cardroom females. Time work.	Bolton private cardroom females.	Oldham card- and blowing-room males.
					Cardroom females.	Grinders.	Throstles and rings.	Weaving.			
'1853.....	100	—	—	—	—	—	—	—	—	—	—
'53.....	110	—	—	—	—	—	—	—	100	—	—
'54-55.....	100	—	—	—	—	—	—	—	100	—	—
'56.....	100	—	—	—	—	—	—	—	105	—	—
'57.....	100	—	—	—	—	—	—	—	105	—	—
'58.....	100	100	—	—	—	—	list net	—	105	+ 1s.	—
'59.....	100	100	—	100	—	—	—	—	105	+ 6d.	—
'1860.....	105	105	100	107½	—	—	—	—	110	+ 6d.	—
'61.....	100	100	90	107½	—	—	—5 per cent.	—	110	—	—
'62.....	100	100	90	100	—	—	—	—	110	—	—
'63-64.....	100	100	90	100	—	—	—	—	110	—	—
'65.....	100	100	100	100	100	100	+ 10 per cent.	100	120	—	—
'66.....	100	105	110	107½ ^a	105	107½	+ 5 per cent.	110	120	+ 6d.	—
'67.....	100	100	100	102½	100	102½	—	105	130	+ 6d.	—
'68.....	100	100	100	102½	100	102½	—	105	130	—	—
'69.....	95	95	95	92½	90	92½	90	91½	130	—	—
'1870.....	100	100	100	97½	95	97½	95	96½	130	—	—
'71.....	100	100	105	102½	100	102½	100	101½	140	+ 1s.	+ 1s.
'72.....	100	105	105	102½	100	102½	100	101½	140	+ 6d.	—
'73.....	100	105	105	102½	100	102½	100	101½	140	+ 6d.	+ 1s. 6d.
'74.....	100	100	105	102½	100	102½	100	101½	140	—	—
'75.....	100	100	105	102½	100	102½	100	101½	150	+ 6d.	—
'76.....	100	100	105	102½	100	102½	100	101½	150	+ 9d.	100
'77.....	95	95	100	102½	100	102½	100	101½	165	—	95
'78.....	90	100	95	92½	90	92½	90	91½	165	—	85

^a A new list adopted with 5 per cent. advance to make prices equal to + 7½ per cent. on old list. The succeeding figures are 2½ per cent. above the levels under the 1866 list.

^b List revised. Revision stated to equal slight reduction.

^c First Oldham list.

^d Second Oldham list, with "quick speed clause." This list effected an advance variously estimated, but probably 5 per cent.

TABLE 1 *Contd.*—*Changes in the levels of standard piece and time rates, 1853-1909.*

Blackburn and Uniform weaving lists.	Oldham spinning list.	Bolton (self-actor) spinning list.	Ashton spinning list.	Preston spinning list.	A private firm in the North and North-East Lancashire Association's district.				Oldham private card-room females, Time work.	Bolton private card-room females.	Oldham card- and blowing-room males.
					Card-room females.	Grinders.	Throstles and rugs.	Weaving.			
'1879.....	85	90	85	87½	85	87½	85	86½	150	90 ^a	85
'1880.....	85	95	90	92½	90	92½	90	91½	150	95	90
'81-82....	90	95	95	92½	90	92½	90	91½	150	95	95
'83.....	85	95	95	92½	90	92½	90	86½	150	95	95
'84.....	90	95	95	92½	90	92½	90	91½	150	95	95
'85-87....	90	90 ^b	90	92½	90	92½	90	91½	150½	90	85
'88-89....	90	95 ^b	95	97½	95	97½	90	91½	157 ^c	95	93½
'1890.....	90	100	100	97½	95	97½	90	91½	180	100	93½
'91.....	90 ^d	100	100	102½	100	107½	95	91½	189	100	102-8
'92.....	90	95½	100	102½	100½	107½	95½	91½	189	100	102-8
'93-98....	90½	100	97	99½	97	101½	92	91½	189	100	99-9
'99.....	92½	100 ^b	100	102½	100	107½	95	94	189	100	102-8
'1900-02....	92½	105	105	107½	105	117½	100	94	198	105	113-1
'03-04....	92½	105	105	107½	105 ^f	117½	100 ¹	94	198 ^g	105	113-1 ^e
'05.....	97	100	105 ^g	107½	105	117½	100	99	198	105	113-1
'06.....	100	105 ^h	110	112½	110	122½	105	101½	207	110	118-8
'07.....	100	110	115	117½	115	127½	110	101½	216	115	124-5
'08.....	100	110	115	117½	115	127½	110	101½	216	115	124-5
'09.....	100	105	110	112½	110	122½	105	101½	207	110	118-8

^a Change to piece rates and reduction of 10 per cent. later in the year.^b Card and blowing-room operatives' wages have followed the changes in this series throughout, but in 1888, 1890, and 1900 male operatives received advances of 10 per cent.^c Change to payment by piece rates. 180 is the equivalent computed level.^d Uniform list.^e Universal list for revolving flat cards agreed upon.^f 5 per cent. net bonus to spinners, piecers, and card-room hands, for twelve weeks in September, October, November, and December.^g Card and blowing-room female operatives, 110. Male operatives advanced 5 per cent.^h Card and blowing-room female operatives, 115. Male operatives advanced 5 per cent.

January 1, 1875, the legal normal week for operatives included in the Acts remained at 60, and this, of course, practically fixed the hours for male adults at 60 also. In 1871, however, the hours were reduced to 59 in the Manchester, Oldham, and Ashton districts. From January 1, 1875, until January 1, 1902, the hours were $56\frac{1}{2}$; since that date they have been $55\frac{1}{2}$.

Average earnings in various districts and occupations.

We have now to consider the statements relating to the earnings of various classes of operatives. For this purpose many thousands of figures exist, and the elementary question of tabulation becomes one of great difficulty. Various methods have been adopted in the following tables, and to save continual references to the sources of individual figures, a general table of references has been compiled in which each authority is given a number. Where only one statement or series of statements is given from any particular authority, the number only of that authority is stated in the "authority" column. Where two or more statements relating to the same years are given by the same authority, they are indicated by a sub-letter, thus, 15a, 15b, &c. Thus, so far as possible, the directly comparable statements have the same reference number and sub-letter. Where one authority, *e.g.*, Schultze-Gaevernitz, uses the figures of an earlier authority for comparison with statements at first-hand, the comparison is indicated either by using the same authority index and sub-letter, or by footnote. In any case, statements for the same locality having exactly the same authority index, whether with a sub-letter or not, are directly comparable.

The list does not pretend to be a complete bibliography of the history of the cotton trade, but only a list of sources of wage statistics. Students wishing to study the industry from other points of view are referred to the excellent bibliography given in Prof. S. J. Chapman's *The Lancashire Cotton Industry*, Manchester, 1904.

List of references containing wages statistics relating to the cotton trade.

- 1 *Wage census*, 1886. C-5807, 1889.
- 2 ,, 1906. Cd-4545, 1909.
- 3 *Returns of wages*. C-5172, 1887.
- 4 A. Ure. *The cotton manufacture of Great Britain*, 1833 and 1861.
- 5 ,, *The philosophy of manufactures*, 1835 and 1861.
- 6 Edward Young. *Labour in Europe and America*. Washington, 1876.
- 7 *Labour Commission*. Reports on the employment of women.
C-6984-xxiii, 1893.
- 8 ,, Evidence, &c.
- 9 Return of Factory Inspectors. H.C. 440 of 1871.
- 10 George Lord to Commission on *Trade depression*, 1886. First and
second reports.
- 11 G. von Schultze-Gaevernitz. *The cotton trade*, 1895.
- 12 Thomas Ellison. *The cotton trade of Great Britain*, 1886.
- 12A ,, Article on *Cotton* in *Chambers' Encyclopædia*, 1887.
- 12B ,, *Hand-book to the cotton trade*, 1858.

- 13 F. Merttens. *The hours and cost of labour in the cotton industry at home and abroad. Transactions of the Manchester Statistical Society, 1893-94.*
- 14 Robert Montgomery. *Manchester in 1834 and 1884. Transactions of the Manchester Statistical Society, 1884.*
- 15 J. R. Macculloch. *Statistical account of the British Empire, 1839 and 1846.*
- 16 H. Dunckley. *Charter of the nations, 1854.*
- 17 Private inquiries and correspondence.
- 18 Industrial Remuneration Conference Report, 1886.
- 19 International Textile Congress Reports, 1893 and 1906.
- 20 Factory Inspector's Report, 1883. Mr. Henderson.
- 21 U.S.A. Consular Report, 1884. *Labour in foreign countries.*
- 22 P. Gaskell. *Artisans and machinery, 1836.*
- 22a ,, *Manufacturing population of England, 1833.*
- 23 G. R. Porter. *Progress of the nation, 1851.*
- 24 J. C. Symonds. *Arts and artizans at home and abroad, 1839.*
- 25 *Cotton and woollen mills of Europe. U.S.A. Consular Report, 1882.*
- 26 *Report of Factory Inspector. xxii of 1842.*
- 27 ,, xxv of 1845.
- 28 ,, xxii of 1849. *Operation of ten hours day.*
- 29 ,, xxiii of 1850.
- 30 ,, xxiv of 1866.
- 31 ,, xiv of 1868-69.
- 32 ,, xiv of 1871.
- 33 ,, xiii of 1873.
- 34 D. Chadwick. *On the rates of wages in Manchester and Salford and the manufacturing districts of Lancashire during the twenty years from 1839 to 1859. Journal of the Statistical Society, 1860.*
- 35 G. P. Bevan. *Industrial classes and industrial statistics, 1877.*
- 36 Edwin Chadwick. *Address on Economy and trade. Social Science Association, 1864.*
- 37 J. Watts. Article on *Cotton* in *Encyclopædia Britannica*, ninth edition.
- 38 S. J. Chapman. *A Reply to the Report of the Tariff Commission on the Cotton Industry. Manchester, 1905.*
- 39 Reports of the Labour Department of the Board of Trade, on *Changes in wages and hours of labour*, for the year indicated.
- 40 Report of the Commission on *Employment of children in factories, 1833.*
- 41 ,, Committee on *Emigration, 1827.*
- 42 Reports of the Commission on *Artizans and machinery, 1825.*
- 43 *Manchester Guardian*, 27th April, 1844.
- 44 *The Beehive*, afterwards *The Industrial Review*, 1866-79.
- 45 J. Haslam. Article in *The Woman Worker*, 9th Oct., 1908.
- 46 McConnel and Co., Ltd. *A century of fine cotton spinning. Manchester, 1906.*
- 47 Report on *Strikes and lockouts of 1892. C-7403, 1894.*
- 48 Fourth report on *Trade unions. C-6475, 1891.*
- 49 U.S.A. Consular Report, 1878. *Wages in Europe and America.*
- 50 L. Levi. *Year-Book of Facts, 1878. Quoted from The Times.*
- 51 J. Noble. *National Finance, 1875.*
- 52 E. V. Neale. *Social Science Transactions, 1884. Article on Wages and cost of living.*

- 53 Bridges and Holmes. Report to the Local Government Board on
Proposed changes in ages and hours in textile factories. C-574, 1873.
- 54 *Report of the Poor Law Commissioners.* British Museum, xxxv of
1842.
- 55 Leone Levi. *Wages and earnings of the working classes*, 1885.
- 56 John Strang. *Money-rate of wages of labour in Glasgow and west of
Scotland. Journal of the Statistical Society*, 1857; and
*Money-rate of Wages in Glasgow and west of Scotland
in 1851, 1856 and 1858. Journal of the Statistical
Society*, 1858.
- 57 Robert Halstead. *Variation of wages in some labour co-partnership
workshops.* The Labour Association, 1901.

Manchester and District.

In any question of comparison of the wages of cotton operatives, the most important district is Manchester, not because it is the most important centre of cotton spinning and manufacturing, for this it has long ceased to be, but because it has almost invariably been the centre of previous investigations, and by far the largest proportion of our material relates to the Manchester district. Unfortunately we are, with very few exceptions, left in doubt as to the area this district is intended to cover. For many purposes it is still the centre of the industry. The chief offices of the Employers' Federation and the Operatives' Federation are still there, and statements made by officials of either side regarding the Manchester district may be intended to apply to the whole Federation area, including Oldham, Bolton, Leigh, Ashton, Rochdale, Bacup, Stockport, and possibly even Preston, Blackburn, and Burnley, or may only be intended to apply to Manchester and Salford, and the immediate neighbourhood. In the three great census inquiries of the Children's Employment Commission of 1833, and the Board of Trade in 1886 and 1906, Manchester means a limited though undefined area, covering Manchester and its immediate neighbourhood. In Chadwick's important statements for 1839, 1849, and 1859 we have figures which, from the title of his paper in the *Journal of the Royal Statistical Society*, 1860, and from internal evidence, are intended to cover Manchester, Salford and Lancashire, but when these were reprinted by Porter, in the *Tables of the Revenue*, and by the Board of Trade in the *Returns of Wages*, 1830-86, they are given as for Manchester and district. Statements made by factory inspectors, relating to a single mill, may be said to relate to a mill in the Manchester district, and yet actually to be from the records of a mill 10 or even 20 miles from the Manchester Exchange. After consideration, it has been thought best to tabulate all these statements relating to Manchester side by side, as well as those intended to apply to the Lancashire and Cheshire cotton area, indicating, so far as possible, the area the statement is intended to cover. Our main reason for this is that Chadwick's statements certainly depend mostly on information relating to Manchester in the narrower sense, and later investigators like Bevan, Baker, Ellison and Merttens have made statements in direct comparison

with Chadwick, applying them more or less to the whole Lancashire and Cheshire industry. Other statements relating definitely to the other most important centres will be tabulated under the heading of those centres, and published in later articles.

The cotton trade divides itself, for purposes of wage comparisons, into three main branches, namely, carding (breaking up the bales and preparing the cotton by means of scutchers, carding engines, and "frames"), spinning (which again divides into mule spinning and ring or throstle spinning), and weaving, with the processes subsidiary thereto. In these three branches there are very many definite and distinct occupations. The wage census of 1886 gives the wages of men under 69 separate occupations or sub-divisions. In that of 1906 many of these disappear, but, nevertheless, there are recorded wages for 22 occupations for men, 3 for lads and boys, 12 for women, and 4 for girls, and some of these are subdivided, while a large number have been classed together under "other men," "other women," &c. Several occupations which are not separately mentioned in 1906 are of importance, as applying to large groups of individuals, *e.g.*, rovers' doffers, ring-spinners' doffers, reachers-in, lap-tenters, weavers' tenters, &c. On the whole, it is not too much to estimate that from bale-breaking to cloth-looking and warehouse work there are between 50 and 80 separate and distinct occupations, each with its own method of payment. Where we have, as in the case of Manchester and district, independent statements for nearly every year for a century, and in some cases two, three, or even more statements by different authorities for one year, it is impossible, or, at least, inadvisable, to put all these statements into one table.² In the case of towns like Oldham, Blackburn, &c., the information is not so unwieldy, and we can bring it together. For Manchester, therefore, the material has been tabulated separately for card and blowing-room males; card and blowing-room females, throstle and ring-spinning, and doubling; mule spinning; reeling, winding, warping, weaving, dressing, and sizing. The question of changes in numbers employed will be discussed in a separate section.

This method has the advantage of enabling us to discuss, with the actual figures before us, changes which have taken place in the status of the occupation, and the difficulties and limitations of our figures. All the comments on figures relating to particular occupations in the Manchester district will apply more or less to other centres, and if our study of the most important and most difficult centre is sufficiently detailed, we can confine ourselves to purely local details when considering the tabulation for other localities; also, we are building up our results as we proceed.

Card and blowing-room males.

Commencing with the card and blowing-room males, we find that statements are usually given for strippers and grinders, these

² An example of such a table may be seen in Bowley's *Wages in the Nineteenth Century*. Since that table was compiled much more information has been accumulated.

being the chief class, and less usually for carders, under-carders, mixers, scutchers, lap-tenters, and lap-carriers. Sometimes these are all thrown together as card-room hands, while at other times it is obvious that the term "card-room hands" excludes the mixers and scutchers, or cotton and blowing-room employés. Practically none of these workers do exactly the same work as did their predecessors of half-a-century ago, but the transition will have been gradual, and the type of operative will have remained unchanged except that the work is now probably more skilled. Changes in their wages have generally been regulated by changes in spinners' rates, but they have at times received special advances either when the spinners' rates have remained unchanged, or, as on three occasions at least, by receiving advances of 10 per cent. when pieceworkers and spinners have only received 5 per cent.

Further information about these operatives will be given later under the Oldham section, in connection with the Oldham and universal card lists. For the Manchester district it is only necessary to give the statement in Table 2.

This evidence is difficult to summarise. Assuming that the statements for card-room males refer mainly to "strippers and grinders," we must accept 15s. to 17s. or 18s. as representing the early years, the statement of a carder to the Commission on Artisans and Machinery of 16s. from 1819 to 1822 fairly substantiating these figures. A reduction seems afterwards to have set in, for the various statements for 1836 are somewhat lower, indicating perhaps 14s. 6d., and by 1841 13s. The Reports of the Factory Inspectors for 1841 several times mention reductions of 10 per cent. having taken place for card-room operatives. An advance by 1845 seems clearly established, perhaps to 14s. 6d. or 15s. Then came the depression and the reduction of hours by the Ten Hours Act, and 12s. 6d. or 13s. seems to fit the evidence for 1849-50. Series 30a shows a 10 per cent. advance in 1853, and a return to the 1850 level in 1854. By 1859-60 the level seems about equal to 1845, advancing after the cotton famine to 16s., and rising rapidly in the early 'seventies to about 22s. or 23s. A reduction took place after to about 21s. 6d., perhaps less in 1879, when the lowest point was reached. The *Returns of Wages* indicates a lower figure for 1883 than for 1880, but this is not borne out by other evidence. From 1886 to 1906 the advance in Manchester was from 21s. 5d. to 28s. 11d., and in Lancashire and Cheshire from 20s. 4d. to 29s. 5d. From the lowest point in the middle of the century to 1906 the advance has been not less than 120 per cent.

Scutchers have not progressed so much. The 1906 census does not state them separately for Manchester, but for Lancashire and Cheshire they advanced from 18s. 10d. in 1886 to 25s. 9d. in 1906. Probably their wages moved very closely with those of strippers and grinders up to 1886, being about the same rates in Manchester but rather lower in other places, and since have advanced by about the equivalent of the general advances to card and blowing-room males, 35 per cent., without any additional increments from improved machinery such as have accrued to strippers and grinders.

TABLE 2.—*Manchester and district. Average earnings of card and blowing-room males for an ordinary week's work, 1796-1906.*

Year.	Scutchers.	Head carder.	Under carder.	Strippers.	Grinders.	Card-room males.	Authority.
1796 ..	s.	s.	s.	s.	s.	s.	46
1806 ..	—	20 to 28*	—	—	—	—	4 a
'11 ..	—	35	—	—	—	15, 17	4 a
'15 ..	—	35	—	—	—	15, 17	4 a
'18 ..	—	40	—	—	—	15, 18/6	4 a
'19-22 ..	—	40	—	—	—	15, 18	4 a
'24 ..	—	34	—	—	16	—	42
'26 ..	—	40	—	—	—	15, 17/9	4 a
'32 ..	—	23, 27	16 and up	10, 12	10, 14	—	43
'33 ..	—	30	—	—	—	15, 17/9	4 a
'33 ..	—	—	—	—	—	14	19 a
'33 ..	—	23/6	—	—	—	—	4 and 40
'33 ..	—	26/2	—	—	—	—	S. Lancs.
'36 ..	—	—	—	14, 16	—	—	4 and 30
'36 ..	—	—	—	13	—	—	Manchester
'39 ..	—	25	—	11	—	—	26 b
'40 ..	—	—	—	—	13	—	26 d
'41 ..	—	—	—	13, 15	—	12, 16	15 a
'41 ..	—	—	—	12	—	—	26 b
'41 ..	—	—	—	12, 13	—	—	26 d
'41 ..	—	—	—	11	12, 13	—	26 g
'41 ..	—	—	—	—	14	—	26 h
'41 ..	—	—	—	—	—	—	15 a
'42 ..	—	—	—	—	—	12, 15	15 a
'43 ..	—	—	—	—	—	12, 18/6	15 a
'44 ..	—	—	—	—	—	13, 16	15 a
'44 ..	—	—	—	—	—	14, 16	15 a

* Earlier in the year, 22s. They ranged from 20s. to 28s., and one was engaged at 25s.

TABLE 2—Contd. Manchester and district. Earnings of card and blowing-room males.

Year.	Scutchers.	Head carder.	Under carder.	Strippers.	Grinders.	Card-room males.	Authority.
1844.....	s.	s.	s.	s.	s.	s.	43
'44.....	—	25, 35	16, 20	14, 16	13, 16	—	3b
'44.....	—	—	—	—	—	13/6½	3c
'45.....	—	—	—	—	—	15	15a
'46.....	—	—	—	—	—	14, 16/6	15b
'46.....	—	—	—	—	—	10, 21	3b
'47.....	—	—	—	—	—	11/4	3b
'48.....	—	—	—	—	—	7/9*	3b
'48.....	—	—	—	—	—	12	28
'49.....	—	28	—	12	13	11/10½	3 and 34
'49.....	—	—	—	—	—	12	3b
'50.....	—	27	—	—	—	12/6	3c
'50.....	—	—	—	13/6	13/6	—	10c
'50.....	—	—	—	10/6	10/6	—	10a
'50.....	—	—	—	11	11	—	10b
'50.....	—	—	—	14	14	—	30a
'53.....	—	—	—	15/4	15/4	—	30a
'54.....	—	—	—	14	14	—	30a
'59.....	—	28	—	14	15	—	30a
'60.....	—	—	—	17	17	—	3 and 34
'60.....	—	—	—	13	13	—	30a
'60.....	—	—	—	14	14	—	10a
'60.....	—	—	—	16	16	—	10b
'63.....	—	—	—	—	21/6	—	30a
'70.....	—	—	—	—	16	—	10d
'70.....	—	—	—	16	16	—	10a
'70.....	—	—	—	17	17	—	10b
'71.....	—	—	—	18	21	—	9a
'71.....	—	28, 30	21	21	21	—	9b

* Short time.

TABLE 2—Contd. *Manchester and district. Earnings of card and blowing-room males.*

Year.	Scutchers.	Head carder.	Under carder.	Strippers.	Grinders.	Card-room males.	Authority.
1871.....	s. 18	s. 28, 35	s. 20, 21	s. 18, 21	s. 18, 21	s.	35 a
'72.....	—	45	30	22	22	—	6 a
'73.....	—	—	—	21	21	—	53
'74.....	—	32	—	19	—	—	33
'75.....	—	—	—	—	20	—	51
'76.....	23	—	—	22, 23	22, 23	—	3
'77.....	19, 20	28, 35	24, 26	19, 24	19, 24	—	35 a
'78.....	—	30	—	22	23	—	35 b
'79.....	—	32, 40	27, 32	—	25, 28	—	37
'80.....	18, 6, 23 2	—	—	21	21, 26	—	3
'81.....	—	—	—	—	—	21/8, 22/6	50
'82.....	—	—	24	24	24	—	44
'83.....	—	45	—	—	22/6	—	49
'84.....	22/6	—	—	22/6	21/6	—	3
'85.....	—	—	—	—	19, 25/6	—	12*
'86.....	19, 24	28, 60	24, 35/6	16/3, 19	19, 24	—	12*
'87.....	22/6	—	—	21	21	—	3
'88.....	—	44	—	19	21/3.	—	52
'89.....	—	—	—	—	—	—	—
'90.....	18/10	—	32/1	20/4	—	—	1+
'91.....	21/6	39 10	26	21/5	—	—	1+
'92.....	—	—	—	—	—	—	—
'93.....	—	—	34/11	—	—	—	—
'94.....	—	28 to 60	—	16/3, 19	—	—	12 a
'95.....	—	—	—	—	—	—	—
'96.....	25/9	39 2	—	29 5	—	—	2+
'97.....	—	41/3	—	28/11	—	—	2+

* Ellison gives two tables called the "range of the principal towns in Lancashire"; but there are small discrepancies between them.
 + Lancashire and Cheshire.
 † Manchester only.

The wage of the carding overlooker is so much a matter of individual bargain that we may at once conclude that while there is substantive evidence of a considerable advance, and the figures of the 1833 census, Chadwick, and the census of 1886 and 1906 are probably representative, there is not enough evidence to justify our attempting to include them in any summary. To a lesser degree this applies to the under-carder, who is presumably included in the statements for overlookers in the sources above-mentioned. Under the Universal List for Cards, provision is made for extra payment to the grinders if no under-carder is employed. Where the quartiles range from 32s. 6d. to 50s. (as in the 1906 census), and the extremes much greater, no one statement is typical, and the only evidence of advance worth consideration is from 23s. 6d. in 1833 to 25s. in 1839, 28s. in 1849 and 1859, 28s. up to 35s. or more in the 'seventies, 25s. to 37s. 11d. in 1886, average 33s. 1d., and 32s. or less to 50s. or more in 1906, average 39s. 2d. From 1833 to 1886 the advance was 36 per cent.; 1886 to 1906, 22 per cent.; and 1833 to 1906, 67 per cent. These form about $1\frac{1}{2}$ per cent. of the men employed.

Card and blowing-room females, and throstle spinning.

The tending of the preparatory machines after carding has always been the work of women and girls. Starting with the drawing frame and the roving frame, intermediate processes were introduced until to-day we may have combing before drawing; drawing, combing, slubbing, intermediate roving, and roving before the cotton is ready for the mule. Throstle spinning has always been an alternative to mule spinning, and the throstle of the early part of the century has been gradually superseded by the "ring" of to-day, ring spinners being in the direct line of succession, just as self-actor minders are to the old hand mule spinners. One curious result of these changes should be noticed. In the early days of the industry the roving frame tenters were the highest paid, the slubbers varied but were generally the lowest, with the drawing frame tenters just a little above. To-day, the average earnings are generally the other way about, except at Bolton, where the roving frame still yields the highest average wage.

The following tabulation gives the figures for the Manchester district:—

TABLE 3.—*Manchester and district. Average earnings of card and blowing-room females and throstle spinners for an ordinary week's work, 1803—1906.*

Year.	Blow-room females. ^a	Drawing frame tenters.	Sub. tenters.	Inter. tenters.	Rover tenters. ^a	Unclassified tenters.	Little tenters (girls).	Doubblers.	Throstle and ring		Authority.
									Overlookers.	Spinners. ^b	
1803.....	s.	s.	s.	s.	s.	s.	s.	s.	s.	10/1½	40
'05.....	—	—	—	—	—	9	—	—	—	—	4 ^a
'08.....	—	—	—	—	—	—	—	—	—	7/5½	40
'09-10.....	—	—	—	—	15, 16	—	—	—	—	—	46 ^c
'10.....	11 3	—	—	—	15 6	—	—	—	—	—	3
'11.....	5/6	—	—	—	8/5	9	—	—	—	—	4 ^a
'12-19.....	—	—	—	—	13, 15	—	—	—	—	—	46 ^c
'12.....	10 1	—	—	—	13 5	—	—	—	—	—	3
'13.....	8/8	—	—	—	11 8	—	—	—	—	—	40
'14-15.....	10	—	—	—	14	10	—	—	—	3, 8 + to 9/6	3
'15.....	—	—	—	—	—	—	—	—	—	—	4 ^a
'16-22.....	9	—	—	—	14	9†	—	—	—	—	3
'18.....	—	—	—	—	—	9	—	—	—	10/5	40
'19-24.....	—	—	—	—	—	—	—	—	—	—	42
'23.....	—	—	—	—	—	—	—	—	—	9/3½	40
'23-25.....	7	—	—	—	17/6	—	—	—	—	—	3
'24.....	—	—	—	—	—	9	—	—	—	—	4 ^a
'26.....	—	7/3, 8/3	7/9, 8/3	—	—	—	—	—	—	—	43
'28.....	—	—	—	—	—	9, 9/6	6, 7	—	—	9/1	40
'32.....	—	—	—	—	—	9 ^d	—	—	—	5 to 9/6	3
'33.....	—	—	—	—	—	6 to 14	3 to 4/6	—	—	8/5½	40
'33.....	—	9/3	—	—	—	—	—	—	—	—	22 ^a
'33.....	—	7/6	7/5½	—	—	average 7/6½	—	—	22/4½	7/9	19
'33 ^e	—	8/6	8/8	—	8	average 8/6½	—	—	23/5	7/8	4 ^c
'33 ^f	—	—	—	—	8/7	—	—	—	—	—	4 ^f
'34.....	—	—	—	—	—	9/6	—	—	—	—	14 ^A

TABLE 3—Contd. Manchester and district. Card and blowing-room females and throstle spinners.

Year.	Blow-room females, ^a	Drawing frame tenters.	Slab tenters.	Inter tenters.	Rover tenters, ^a	Unclassified tenters.	Little tenters (girls).	Doubblers.	Throstle and ring		Authority.
									Overlookers.	Spinners.	
1834.....	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	14 B
'34.....	7/8	—	—	—	—	8/9	—	—	—	—	14 C
'34.....	—	—	—	—	—	9/5	—	—	25	9/6	14 D
'34.....	—	—	—	—	—	8	—	—	—	—	14 E
'34.....	—	—	—	—	—	6/6	—	—	—	—	14 H
'35.....	—	—	—	—	—	9	—	—	—	—	14 F
'36.....	—	—	—	—	—	6/6	—	—	—	—	26 a
'36.....	—	—	—	—	—	10/6	—	—	—	—	26 b
'36.....	—	—	—	—	—	9/6	—	—	—	—	26 c
'36.....	—	—	—	—	—	7, 9	—	—	—	—	26 d
'36.....	—	—	—	—	—	—	—	—	—	—	26 f
'39.....	—	10/6	—	—	—	—	—	—	—	10/6	26 f
'39.....	—	10	—	—	—	—	—	—	—	10	26 f
'39.....	7	7/6	8	—	8	—	—	7	—	—	14 J
'40.....	—	6/6	7/6	7/6	7/6	7/6, 12	—	—	18	4, 7	3 and 34 ^g
'41.....	—	—	—	—	—	7/6, 11/8	3, 6	—	—	8/6, 11	15
'41.....	—	—	—	—	—	7/6	3, 6	—	—	8, 10	15
'41.....	—	—	—	—	—	8, 8/6	—	—	—	—	26 a
'41.....	—	—	—	—	—	9	—	—	—	—	26 b
'41.....	—	—	—	—	—	7, 9	—	—	—	—	26 c
'41.....	—	—	—	—	—	—	—	—	—	—	26 d
'41.....	—	10	—	—	—	—	—	—	—	—	26 f
'41.....	9	8, 9	—	—	10, 11	—	—	—	—	9/6	26 g
'41.....	—	9	9	—	—	—	5, 7	—	—	1838-41	26 g
'41.....	—	—	9	—	—	7/6, 10	—	—	—	9, 11	26 h
'42.....	—	—	—	—	—	7/6, 10	3, 6/6	—	—	10	15
'43.....	—	—	—	—	—	8, 10	3, 7	—	—	8/6, 10	15
'44.....	—	—	—	—	—	—	4, 7	—	—	8/6, 10	15

TABLE 3—Contd. *Manchester and district. Card and blowing-room females and throstle spinners.*

Year.	Blow-room females, ^a	Drawing frame tenters.	Slub tenters.	Inter. tenters.	Rover tenters, ^a	Unclassified tenters.	Little tenters (girls).	Dobblers.	Throstle and ring		Authority.
									Overlookers.	Spinners.	
1844.....	N.	S, 10	N.	N.	N.	N.	N.	N.	N.	N.	43
'44.....	—	—	S, 10	—	—	8/9	—	—	—	—	3 b
'44.....	—	—	—	—	—	7 6	—	—	—	—	3 c
'45.....	—	—	—	—	—	8, 11	4 6, 7	—	—	8	15
'45.....	—	—	—	—	—	8, 10	—	—	—	9 6, 10/6	3 b
'46.....	—	—	—	—	—	8, 10	2 to 6	—	—	10	15
'46.....	—	—	—	—	—	6/6	—	—	—	—	3 b
'47.....	—	—	—	—	—	3 4	—	—	—	—	3 b
'48-49.....	—	—	—	—	—	8 9	—	—	—	—	3 b
'48.....	—	—	—	—	—	7/9	—	—	—	—	28
'49.....	—	—	—	—	—	7 6	—	—	—	7/6	3 c
'49.....	7 6	7	8 6	8/6	8 6	—	—	7/6	20	4 6, 7/6	3 and 34 s
'50.....	—	—	—	—	7 6	—	—	—	—	—	10 a
'50.....	—	8/3	—	—	7/6	—	—	—	—	—	10 b
'50.....	—	—	—	8	8 3	—	—	—	—	—	10 c
'50.....	—	—	—	—	—	12	—	—	—	8/9	30 a
'53.....	—	—	—	—	—	13 2	—	—	—	9/8	30 a
'54.....	—	—	—	—	—	12	—	—	—	8/9	30 a
'59.....	8	8	9	9	9	—	—	9	24	5, 9	3 and 34 s
'60.....	—	—	—	—	11	—	—	—	—	10	10 a
'60.....	—	—	—	—	11	—	—	—	—	—	10 b
'60.....	—	—	—	—	—	13/6	—	—	—	11/9	30 a
'65.....	—	—	—	—	—	15	—	—	—	—	30 a
'70.....	—	—	—	—	14	—	—	—	—	13	10 a
'70.....	—	—	—	—	11/6	—	—	—	—	—	10 b
'70.....	—	10 6	—	—	9/6	—	—	—	—	—	10 d
'71.....	—	—	—	—	—	9, 12	—	—	—	—	9 a

TABLE 3—Contd. Manchester and district. Card and blowing-room females and throstle spinners.

Year.	Blow-room females, ^a	Drawing frame tenters.	Sub. tenters.	Inter. tenters.	Rover tenters, ^a	Unclassified tenters.	Little tenters (girls).	Doubblers.	Throstle and ring		Authority.
									Overlookers.	Spinners.	
1871.....	s. 12	s. 12, 13/6 13, 15	s. 13, 16/6	s. 16, 20	s. 13, 18	s. —	s. 7, 9/6	s. 12	s. 26	s. 11/6, 12 12, 15	35 a 9 b
'71.....	—	11	13	—	—	—	—	—	—	—	6 a 6 b
'72.....	—	—	—	—	—	—	—	12	—	12/6	53
'73.....	—	11	13 to 16	—	—	—	—	—	—	—	33
'73.....	12	—	—	—	—	6	—	12/6	—	—	3
'74.....	12	12	11 to 16	—	—	11	—	10, 15	—	—	51 a
'74.....	—	—	—	—	—	10/6	—	—	—	—	51 b
'74.....	—	—	—	—	—	—	—	—	—	—	35 b
'76.....	13/6	14/3	—	13	15/6	—	—	11	—	—	35 a
'76.....	15	17/6	17/3, 20	14, 18	16, 20	—	9, 10	12, 15	30, 35	12, 14	3
'77.....	13/6, 14, 2	17/6, 18/7	16/6, 18	—	16/6, 18	—	6/6, 8/10	12	27/6	17/6	10 a
'77.....	—	—	—	—	17	—	—	—	—	15	10 b
'77.....	—	—	—	—	19/6	—	—	—	—	—	10 d
'77.....	—	10/6	—	—	10	—	—	—	—	—	50
'77.....	14, 16	16, 18	16, 18	16, 18	16, 18	10/6, 12	9, 10	14, 18	30, 35	12, 14	37
'77.....	—	16	—	—	—	—	—	—	—	—	44
'79.....	13/6	18	18	18	18	—	—	—	32/6	11	49
'80.....	—	14, 15/4	15	—	15	—	7/3	—	25	14	3
'82.....	—	12/6, 18/9	16, 24/3	14, 20/6	14, 20	—	9, 10	—	30, 35	12, 14	12
'82.....	12, 15	12/6, 18/6	16, 24	14, 20	14, 20	—	—	—	—	12, 14	12
'83.....	12/9	12/9	14/3	—	14/3	—	—	—	—	—	3
'83.....	—	—	—	—	18	—	—	—	—	15	10 a
'83.....	—	—	—	—	18	—	—	—	—	—	10 b
'83.....	—	11	—	16/6	14	—	—	—	—	—	10 c
'83.....	—	10/6	—	—	10	—	—	—	—	—	10 d
'84.....	—	—	—	—	—	15/3	—	—	—	—	14 A

TABLE 3—*Contd. Manchester and district. Card and blowing-room females and throstle spinners.*

Year.	Blow-room females, ^a	Drawing room tenters.	Slub tenters.	Inter. tenters.	Rover tenters, ^a	Unclassified tenters.	Little tenters (girls).	Doubblers.	Throstle and ring		Authority.
									Overlookers.	Spinners.	
'84.....	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	14 B
'84.....	—	—	—	—	—	16/6	—	—	—	—	14 C
'84.....	12/9	—	—	—	—	13/4	—	—	34	11	14 D
'84.....	14	—	—	—	—	14	—	—	—	—	14 E
'84.....	13	—	—	—	—	11	—	—	28	11	14 F
'84.....	—	—	—	—	—	10/6	—	—	—	—	14 H
'84.....	—	—	—	—	—	12/6	—	—	—	—	14 J
'84.....	—	—	14	—	14	15	—	—	—	12	21
'84.....	—	10, 16 or 18	15, 18	—	—	—	7/2	—	28	10/6	52
'84.....	10/9	17	16	16	16	—	—	—	—	—	—
'86.....	11/10	14/9	15/4	15/4	15/4	15/2 ⁱ	—	11/10	—	12/6	1 ^c
'86.....	11/8	13/8	14/1	14/1	—	13/9 ⁱ	7/9	—	26/6	10/5	1
'87.....	12, 15	—	—	—	—	—	—	—	30, 35	9, 14, 10, 20	12 A ^g
'87.....	—	—	—	—	—	—	—	—	—	12, 14	13
'87.....	—	—	—	—	19	—	—	—	—	17	10 ^a
'90.....	—	—	—	—	19/6	—	—	—	—	—	10 ^b
'90.....	—	—	—	—	—	17	—	—	—	14	7
'91-92	—	—	—	—	—	—	—	—	—	14, 15	7 ^a
'91-92	—	—	—	—	—	—	—	—	—	—	19
'93.....	—	19	17/6	—	—	—	9, 10 _h	—	—	—	19
1906.....	—	20	19/8	19/2	19/3	18, 26	—	14	h	15/7	2 ^c
'06.....	h	—	—	—	—	19/6 ⁱ	—	—	—	—	—
'06.....	h	18/4	17/10	19/5	16/7	16/4 ⁱ	h	12/10	h	13	2 ^f
'06.....	12	19	19	17/1	22	—	10	—	—	—	45

Notes to Table 3.

^a From 1810 to 1825 the rates given under blow-room females are for "pickers," and are from the *Returns of Wages*. The rates for rovers from 1809 to 1825 are for stretchers. See note ^c below.

^b From 1803 to 1825 these rates would apparently be for water frame spinners as the throstle was not introduced until then. They were stated in 1833 as referring to throstle spinners.

^c The rates are for women on "stretchers," which apparently did the work of the slubbing and roving frames. The following was the make-up of a mill in 1797: 12 carding engines, 18-in. cards; 20 heads drawing rovers; 2 stretching frames, 90 spindles each; 30 mules, 180 spindles each.—(*A Century of Fine Cotton Spinning*, p. 36.) Babbage speaks of "a machine called in the cotton manufacture a 'stretcher,' worked by one man," which produced as follows:—

	Lbs. of cotton spun.	Roving wages per score.		Rate of earnings per week.	
		s.	d.	s.	d.
1810.....	400	1	3½	25	10*
'11.....	600	0	10	25	0
'13.....	850	0	9	31	10½
'23.....	1,000	0	7½	31	3

and at another stretcher, the roving a little finer,

1823.....	900	0	7½	28	1½
'25.....	1,000	0	7	27	6
'27.....	1,200	0	6	30	0
'32.....	1,200	0	6	30	0

* In 1810 the wages were guaranteed not to be less than 26s.

The only other references to stretchers are in the *Manchester Guardian* for April 29, 1844, where men stretchers were said to have earned 16s. to 23s. in 1826, and 13s. to 20s. in 1844, and in the *Returns of Wages*, which gives, 1832, 25s., 26s.

^d These figures are from Authority 4a.

^e South Lancs, and for 1886 and 1906 Lancs and Cheshire. In 1833 the exact area covered was Manchester, Stockport, Ashton, Glossop, Oldham, Bolton, Warrington, and one mill at Bury.

^f Manchester only.

^g The lower rates under spinners are for girls and the higher for women. In 1887 the 9s. to 14s. is for girls and the 10s. to 20s. for women.

^h In 1906, blowing-room women were classed with "other women"; throstle spinners' overlookers were presumably classed with spinning overlookers generally, and little tenters were classed with "other girls."

ⁱ Average of all tenters. In 1906 the Manchester average includes tenters unclassified, average 11s. 11d.; and the Lancashire and Cheshire average includes unclassified tenters at 21s. 5d.

These figures are little better, at first sight, than chaos itself. All are apparently genuine and given in good faith, yet the range is so great that we can have 6s. 6d. and 9s. 6d. stated as the average for the same year in the same district. The key to the difficulty

lies in the higher average wages in Manchester itself than in surrounding centres in early years, and the lower average of Manchester compared with other districts in more recent years. If we take the whole 1833 census and compare with Chadwick for 1839, 1849, and 1859, the most typical figures for about 1876-77, and the census of 1886 and 1906 for Lancashire and Cheshire, we get the following general view:—

TABLE 4.—*Estimated average wages of card and blowing-room females and ring spinners. Lancashire and Cheshire. 1833-1906.*

	1833.	1839.	1849.	1859.	1876-77.	1886.	1906.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Blow room	—	7	7 6	8	13 6, 15	11 10	—
Frame tenters	7 6	7 6	8	9	17	15 2	19 6
Throstle and ring } spinners	7 9	7	7 6	9	14	12 6	15 7

The Manchester figures, starting higher and ending lower, will have cut across these figures, and most of the evidence seems to point to the approximate equalisation having taken place between 1849 and 1860. In 1849-50 the statements are very close, if we except those from Series 30a, which do not seem typical. The constant recurrence of 7*s.* 6*d.* at this date is quite significant. By 1860, a very busy time, Chadwick's figures are still lower than any other. The only safe generalisation that we can make from Table 3 appears to be that during the first half of the century wages did not vary very greatly, rarely rising above 10*s.* or falling below 7*s.* 6*d.* in the South Lancashire district generally, and 8*s.* 6*d.* in Manchester. After 1848 wages were distinctly lower than before, partly because of the great reduction in the hours of labour, but the period 1847-50 is too much obscured by intense trade depression to assign causes of reduction. From 1850 on to 1876-77 the figures are on the whole progressively higher, falling after, but again advancing, until by 1906 a higher average was reached than was ever attained before.

It should be noticed that in all the tables relating to card-room tenters, the averages for 1906 are for women only. There are, of course, some girl tenters, usually earning a lower wage, and often-times working at single frames. The averages given therefore are a little too high, but the wage census affords us no means of making the necessary correction. It is, however, only a matter of pence.

(To be continued.)

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1.—*Erhebung von Wirtschaftsrechnungen minderbemittelter Familien im Deutschen Reiche.* 2^{tes} Sonderheft zum Reichs-Arbeitsblatte. Bearbeitet im Kaiserlichen Statistischen Amte; Abteilung für Arbeiter-Statistik. 77 + 229 pp., 4to. Berlin : Carl Heymann, 1909.

The first inquiry undertaken by the Labour Department of the German Imperial Statistical Bureau, under the competent direction of Dr. Feig, into the income and expenditure of working-class and other families of moderate means, has been effected with conspicuous success. The 852 household budgets obtained and reduced may seem small in number compared with the 5,046 obtained from our recent Board of Trade inquiry in Germany, and with the 11,156 budgets of normal families obtained in the United States inquiry of 1901. In the present case, however, the aim was not in the direction of numbers, but of accuracy and completeness in the data used for reduction. In this respect the inquiry is almost the first of its kind, for the data were taken only from detailed house-keeping books which had been issued by the Department and carefully kept for twelve months by the housekeeper. If there be included the work of the householders who contributed the data, this investigation has surely involved more labour than any previous survey of expenditure of consumers in any country.

The inquiry included 522 working-class households, but extended also to school teachers and the lower grades of State and municipal officials. The 382 skilled artisans included in the manual workers

represented every important industry, except mining, and also several of the less important trades. There were also included 79 teachers, 67 lower grade officials, and 39 middle grade officials. The intention was to obtain returns from all parts of the German Empire. Of 852 completed house-keeping books actually received, 701 came from 34 of the greater towns, *i.e.*, those whose population is over 100,000; and of the remainder, 24 came from medium-sized towns, 47 from small towns, and 20 from country villages. The numbers and limits of population are all exactly stated. It was not found possible to obtain returns distributed geographically in proportion to population; indeed, the disparity in this respect is rather unfortunate. Berlin is very much under-represented, while Hamburg is over-represented, owing to the enthusiasm of its local statistical bureau, and the associations which co-operated with it. It is strange that Berlin could not have been thoroughly investigated by the Imperial Statistical Bureau itself. Such small towns as Görlitz, Halle, and Schöneberg have sent more returns than much larger industrial towns, such as Essen, Dortmund and Mannheim. Görlitz has the same number of returns as Leipzig, which is five times its size.

Complete information is given as to the constitution of the families. Particulars were required of the total income from all sources, and of every item of expenditure throughout the twelve months for which the record was kept. Detailed forms for keeping the household accounts were made up into books, one for each month. A total number of 4,136 books was distributed in the first instance, the majority of records beginning on January 1, or February 1, 1907. As many families had misunderstood the nature of the work expected of them, only 3,855 were begun, and 3,575 were continued for one month or more. The number of families who continued their records for six months or more was 1,659, and 960 completed the record for the whole year. Of these 960 records, 107 were rejected for various reasons. Of the remaining 853 records, one was rejected because the income, 9,130 marks, was regarded as overstepping the limits of the inquiry. It is a little difficult, however, to see why this record for a family of 7 persons was rejected, while one with a total income of 8,877 marks for a family of 6 persons was included.

Great care has been taken in the pursuit of accuracy, but we may well consider whether there is internal evidence of the degree of accuracy attained. The simplest test of the completeness of the entries is that total receipts and expenditure should balance. Yet the grand total of receipts (1,867,652 marks) is less than that of expenditure by 35,735 marks. This, apparently, has nothing to do with savings made during the year, which amount to only 1.17 per cent. of the total receipts. The following table shows the distribution of the budgets and of surpluses and deficiencies by income groups:—

Number of budgets.	With a total expenditure of	With surplus.	With deficiency.
	Marks. Marks.		
13	Less than 1,200	9	4
171	1,200 to 1,600	91	79
234	1,600 „ 2,000	119	114
190	2,000 „ 2,500	93	97
103	2,500 „ 3,000	43	60
102	3,000 „ 4,000	38	59
34	4,000 „ 5,000	11	23
5	Over 5,000	2	3

In the budgets showing deficiencies the average deficit is 4·4 per cent. of the total expenditure; the surplus percentage is 2·6. The conclusions of an interesting discussion are that the deficits are partly real and partly due to omissions. There may have been more money in hand at the beginning of the year than at the end, savings may have been drawn upon, or extra earnings not entered where the husband did not disclose them to his wife, or articles pawned or sold without the fact having been noted. It was proved, too, that government employees were afraid of disclosing all their additional earnings, lest their right to make them might be questioned. The surpluses are accounted for sometimes by a larger carry forward, but more often, probably, by omission of entries. It is certain, then, that omissions were not infrequent, as would naturally be expected when every penny had to be accounted for; but we may perhaps conclude that omissions, whether of income or of expenditure, have rarely exceeded 5 per cent. When compared with the error possible, and usually occurring, in budgets obtained in the common way by *ex post facto* questions, or from accounts not kept on a uniform plan, this result may be regarded as satisfactory.

The facts elicited by the investigation are presented in a great variety of ways. Most important is the innovation of publishing singly details of every budget continued for six months or more. Together with the totals for each town and district, and for classes of towns by size, the detailed figures of budgets completed for twelve months occupy 148 pages of the body of the work. Those continued for only six to eleven months are printed in full in an appendix, but they are not included in the reductions. There are numerous summary tables displaying averages of receipts and expenditure, the items of expenditure being classified under fifty-six headings. The introduction includes a description of the methods of the inquiry, a summary of previous work, and discussions from various points of view of the figures obtained, as follows:—A general review of receipts and expenses, and of their fluctuations; discussions separately of receipts and expenses, according to the number of the family; by income groups, according to locality and by sizes of towns, then according to occupations; and, finally, by reduction of the data for normal families to a common unit. There is also a discussion of the kinds of foods consumed, and of the use of alcohol. A special section compares the average budgets of the

manual workers as a class with those of the officials and teachers as another class; and a diagrammatic representation shows strikingly the greater expenditure on food of the former class for all incomes, and the greater expenditure of the latter on lodging and miscellaneous items.

A few figures showing the general results of the inquiry may be quoted. The average receipts of different kinds for the year, reckoned on the whole 852 families, were:—

Source of income.	Number of cases.	Average receipts.	Percentage.
		Marks.	
Husband's principal work	850	1,805·3	82·4
„ extra work	326	51·1	2·3
Wife's receipts	278	60·3	2·7
Earnings of children	112	36·8	1·7
Receipts from sub-letting	207	44·1	2·0
Other cash receipts	652	174·9	8·0
Receipts from property—			
From own or free residence	40	12·2	0·6
Agricultural and garden land	75	2·9	0·1
Dairying	31	2·5	0·1
Other uses of property	22	2·0	0·1

The percentage distribution of expenditure according to expenditure groups is shown in the following table:—

Families with an expenditure of	Under 1,200 marks	1,200 to 1,600 marks.	1,600 to 2,000 marks.	2,000 to 2,500 marks.	2,500 to 3,000 marks.	3,000 to 4,000 marks.	4,000 to 5,000 marks.	Over 5,000 marks.	All families.
Number of families .	13	171	234	190	103	102	34	5	852
Percentage of expenditure on—									
Food and luxuries	54·2	54·6	51·0	48·1	42·7	83·1	32·8	30·3	45·5
Clothing, laundry, &c.	9·2	9·5	11·5	12·6	14·3	14·0	14·7	14·9	12·6
House rent and up-keep	20·0	17·2	18·0	17·6	18·0	18·5	19·3	14·9	18·0
Heating and lighting	6·2	4·8	4·5	4·0	3·9	3·6	3·1	3·1	4·1
Various	10·4	13·9	15·0	17·7	21·1	25·8	30·1	36·8	19·8

The decreased expenditure on consumable goods (food, heating, and lighting), with increase of income comes out clearly, and is a further verification of Engel's law. There are more than a hundred summary tables.

In the introduction to the report, some criticism is offered of the data of working-class expenditure collected in the recent inquiry by the Board of Trade into the cost of living in German towns. The report, after a criticism of the Berlin inquiry of 1903 on the ground that questions as to the whole year's expenditure were

asked only at the close of the year, proceeds:—"The data on which the English Board of Trade rely are, in addition, insufficient. The Board of Trade issued a great number of question papers to trade unions and other workmen's societies, in which were to be entered the earnings of workmen's families and their expenditure on food during a normal week. Quantities were also to be stated by weight and measure. In this way the Board of Trade received 5,046 household budgets, which, however, were not separately published, but only serve for the purpose of calculating averages for 5 income groups, without classification by geographical situation, or by occupation, and only taking account of size of the family in so far as the average number of children in each income group is given. The data of the 5,046 budgets do not, therefore, afford more than an impression; they cannot be regarded as an accurate representation of 'average' or 'typical' German working-class housekeeping."

While admitting freely that the English investigation into earnings and expenditure did not equal in careful elaboration, and in the probable trustworthiness of its results, the inquiry now under notice, it should be remembered, on the other hand, that the greater number of budgets in the English inquiry would tend to make the average accurate, unless there were errors of bias. One such error—laxity in entering or remembering small items—would probably be much less when accounts had to be kept only for a week than when perseverance was required for a whole year. It must be presumed, however, that the German Imperial statisticians are satisfied that there was no laxity of keeping accounts in the later months. The principal sources of error which would be likely to affect the one-week accounts as typical of annual income and expenditure are, on the side of receipts, the liability to omission of small extra earnings, and the possibility that the investigation is made in the slack or busy season; and, on the side of expenditure, the probability that expenditure on holidays, and on expensive articles, such as renewals of clothing and furniture, would be omitted. These would be purchased partly out of the savings of the past few weeks, but chiefly out of one week's earnings; and such expenditure, being abnormal, is not likely to have been incurred in the week of account. The Board of Trade inquiry was strictly limited, however, to expenditure on food, fuel and house-rent.

Possibly some of the above reasons may account for the striking difference between the two inquiries in regard to the percentage of income spent on food. In the German inquiry it ranges from 53·5 down to 49·6 for working-class families, as the average annual income increases from 1,430 to 2,650 marks, while according to the English data it ranges from 62·3 down to 56·3 as the average weekly income increases from 27s. 1d. to 48s. 8d. In this respect it is probable that the German figures are the nearer to the truth, for when we turn to particulars of income we find that the earnings of the head of the family form a much larger proportion of the total family income in the English report than in the German. It is probable that the English data do not generally include extra earnings of the man, but merely state his regular wages; and on this hypothesis we may compare the English figures, 93·4 and 89·8 per

cent., as the proportion of the man's earnings to the whole, with 88.4 and 84.1; or, including the man's extra earnings, in the German figures, with 89.9 and 86.8.¹

These German figures, however, contain data for the official class, since those of workers alone are not detailed by income groups. But this probably makes little difference, as the appropriate German figures for working-class families of *all* incomes are 82.2 and 84.4, without and with extra earnings. The English percentages are so much higher as to suggest the failure to record an average of some 6 or 7 per cent. more of the true income than is probably missed in the German figures, income possibly derived from sub-letting, garden produce, etc.

The German criticism appears to be unwarranted in regard to the English data of expenditure on food; for a large number of one-week returns, taken, as they were at different times, would give a fairly true sample, even though the distribution was not quite uniform throughout the twelve months. That this opinion is correct seems to be confirmed by a comparison I have made of the English and German details of food expenditure in regard to the only income group which has nearly the same average in each inquiry. After correcting the German data to exclude tobacco, we have the following figures and percentages:—

Average weekly expenditure by British and German investigations compared.

	K. Stat. Amt. 1,200—1,600 marks.			Board of Trade. 25s. and under 30s.		
Number.....	154			1,329		
Total—	s.	d.	Per cent.	s.	d.	Per cent.
Weekly expenditure	27	3	100	27	1	100
Food and drink	14	7	53.5	17	6½	64.8
Total on food and drink...	14	7	100	17	6½	100
Bread.....	2	7¼	17.8	2	6¾	14.6
Meat	2	6½	17.5	3	5¾	19.7
Sausage.....	1	0	6.9	1	4	7.6
Fish	—	2½	1.5	—	2¾	1.3
Eggs	—	5	2.9	—	7½	3.6
Milk	1	6¾	10.8	1	3½	7.4
Cheese	—	3¼	1.7	—	3¾	1.8
Butter	1	0¾	7.2	1	3¾	7.5
Margarine and other fats	—	8½	4.5	1	1	6.2
Potatoes.....	—	6¾	3.7	—	10¼	4.9
Green vegetables and fruit.....	—	7½	4.3	—	8	3.8
Flour, rice, barley, oatmeal, &c.	—	6	3.5	—	8	3.8
Coffee, cocoa, tea, &c.....	—	6	3.4	—	9½	4.5
Sugar, syrups, &c.	—	4¾	2.7	—	5½	2.6
Salt and condiments	—	2	1.2	—	2½	1.2
"Other"	—	0¾	0.2	—	5¼	2.5
Beer, &c.	—	7¼	4.2	—	8¼	3.9
Meals "out"	—	10½	6.0	—	6½	3.1

¹ As three English income groups correspond to two German, I have averaged the two higher English groups, giving weight to the number of families they contain.

Owing to the above-mentioned reasons, the English expenditures probably belong to a slightly higher income group than the German figures, but the percentages may be compared. They show a close agreement in regard to a number of items: sausage, cheese, butter, green vegetables, flour, &c., sugar, &c., and salt and condiments; and the divergence in regard to other items may easily be explained as partly fictitious and due to undoubted differences of classification, and partly real, being caused by changes of prices which occurred during the interval 1905-07, *e.g.*, the rise in the price of bread.

It may be hoped that this remarkable volume is but a first instalment of the reductions to be made of the great mass of valuable data collected. A monthly treatment of the figures is attempted only in the case of the total income and expenditure of forty-two of the working-class families, the monthly totals being stated separately to show the fluctuations. It would be interesting, for instance, to know what were the monthly variations of the consumption of certain commodities, such as eggs and bread, whose price changed considerably during the year; for we should then be able to draw the demand curves for the working and official classes. One also wonders whether nothing is to be done with all the books kept for less than twelve months. Good use could, no doubt, be made of the 3,575 books kept for at least one month, in the study of places not properly represented by twelve-month books, and also in obtaining confirmation of class and occupation averages. It is to be remembered, however, that it is rather for its method of collection of data than for perfection of the reductions that this German inquiry is noteworthy. Indeed, its publication may well prove an epoch-making event in the study of consumption if it stimulates other countries to follow the example. H.S.J.

2.—*Die Volkszählungen Maria Theresias und Josef II.* 1753-1790. Von Dr. Alfred Gürtler. xv + 152 pp. + tabular appendix. 8vo. Innsbruck: Verlag der Wagner'schen Universitäts-Buchhandlung, 1909.

This book is a useful contribution to the history of Austrian census statistics, covering the period 1753-90, or part of the reign of Maria Theresa and the reign of Josef II. The period falls naturally into two parts, the first ending about 1770, characterised by the legislation of Maria Theresa, and the second from 1770 onwards, dominated by the legislation of Josef, who, although not sovereign of Austria till 1780, became regent in 1766. The census legislation of the first epoch is declared to be unsurpassed in Austria down to 1857. The population enumerations of Josef and his successors were, from the point of view of the modern census, too much governed by military considerations, since they were designed to meet the requirements of a system of conscription. The author gives numerous and copious extracts from the legislation and decrees of the time under review, and also many examples of the results of the enumerations, some of which are exhibited in a series of interesting tables forming an appendix to the book. As an example of the Theresian enumerations may be mentioned that of 1754, which

classified the population into the age-groups 1—15, 15—20, 20—40, 40—50, and above 50, distinguished the sexes in all age-groups, and, except in the first group, differentiated the married and unmarried, leaving it uncertain to-day, however, in which class the widowed were included. The enumerations of Josef II were more concerned with ascertaining the age and social conditions of the male population, the females being generally included indiscriminately in one total. From the special standpoint of military service it must be admitted that these latter enumerations appear to have been fairly satisfactory. Of considerable interest is the combined population, agricultural and industrial census legislation of 1788, described in the final chapter of the book.

These old enumerations are not of course comparable with the modern census. They often covered only parts of the empire, and did not ascertain the population existing at any given time, although for the purpose for which they were undertaken these considerations were more or less unimportant. Dr. Gürtler's book may be recommended to those who desire to trace the historical growth of census-taking.

A.D.W.

3.—*Essais de statistique morale. II. Le divorce et la séparation de corps.* Par Camille Jaequart. 166 pp., 8vo. Bruxelles: A. Dewit, 1909.

The statistical study of divorces over long periods of time, or in different countries, is extremely difficult. Divorce is a legal fact, and the number of divorces will depend very largely on the statutory provisions under which a married person may claim and obtain a divorce, and also on the strictness with which the law is interpreted by the courts. Hence, even if the laws with respect to divorce in any country remain unchanged over a long series of years, the administration of those laws may undergo modification in such a way as to increase or diminish the applications for and grants of divorce. These difficulties are fully recognised by M. Jaequart in the present essay. No attempt is made to compare directly the divorce statistics of one country with those of any other. All that is aimed at, or indeed possible, is to investigate the movement in the numbers of divorces, and from the relative movement to draw inferences respecting the influences affecting those numbers.

The essay is divided into two parts. In the first part divorces in Belgium are discussed in detail, while in the second part statistics of divorces in other countries are considered. In both parts conclusions are deduced respecting the causes of the observed increase in the numbers of divorces in recent years, and of the noted preponderance of divorces in some regions over those in others. Apart from legislation, which, as already mentioned, plays the chief part in the determination of the frequency of divorces, the author attributes the recent growth in their number largely to the development of individualist ideas, especially among women. It is in the best educated countries that divorces tend to be most frequent. "The extension of education democratises divorce." If education encourages, religion tends to discourage divorces, the

Roman Catholic religion in particular exercising a restraining influence. It is remarked, too, that divorces are relatively more numerous in urban areas than in rural, and for this phenomenon many reasons are adduced. It is perhaps worth pointing out that statistics of divorces in towns may be liable to a certain amount of inflation, in consequence of the fact that the law courts are generally situated therein. The author brings into prominence an apparently considerable degree of correlation between the frequency of divorces and the rate of legitimate births, and also the rate of suicide. He does not, however, give mathematical expression to this correlation.

The large mass of facts in the book is well handled, and the conclusions based on them, as indicated above, appear in the main to be sound.

A.D.W.

4.—*Saluti senectutis. Die Bedeutung der menschlichen Lebensdauer im modernen Staate. Eine sozial-statistische Untersuchung.* Von Alfred von Lindheim. II Auflage. xii + 501 pp., la. 8vo. Leipzig and Vienna: Franz Deuticke, 1909.

This "social-statistical" inquiry into the value of the duration of the life of the human individual to the modern state is full of interest. The object of the study is to demonstrate that it is to the highest interest of the State to endeavour to lengthen human life, and to maintain the active powers of its individual citizens to the latest possible age. Besides the author's own matter, there are comprised in the book several short monographs or essays by authorities on particular aspects of the general subject.

The book, though lengthy, contains, apart from the introduction, only seven chapters, which form convenient divisions in the development of the thesis. The first chapter is devoted to a discussion of the duration of life of plants and animals and of man's relation to them. It contains a short essay by Dr. Karl Eckstein, which its author concludes by urging that, for the sake of the development of future generations we should take care to avoid a reckless waste and destruction of the free gifts of nature, and should seek to maintain useful forms of life. The second chapter deals with the mortality and length of human life in past times. Dr. Max Nordau writes on "The value of human life," tracing the change from the little importance attached to human life by the ancient, and even by the mediæval peoples, to the high esteem in which it is held to-day. Dr. Max Kemmerich contributes the results of an investigation into "the length of life and causes of death in the German imperial and royal families" from the Carolines onwards, while Dr. F. Prinzing similarly discusses the mortality in the burgher population of Germany. The material available for the subject investigated in this chapter is of course scanty and select, but it seems to bear the general conclusion based upon it that the average duration of life has undoubtedly lengthened with the progress of civilisation and especially of hygienic science. The third chapter is confined to the study of longevity, and gives numerous examples, well authenticated and otherwise, of long life both in ancient and recent times. There is an interesting statistical examination of the

physical conditions of over 700 men and women of 80 years of age and upwards in Viennese institutions. From this inquiry the author draws the conclusion that the factors conducive to long life are legitimacy of birth, healthy and long-lived parents and grandparents, nourishment at the breast in early infancy, moderation and regularity in living, and active employment to the latest possible age. He also infers that length of life is more or less independent of poverty or wealth as such, of town or country upbringing, and of trouble and sickness if the temperament be happy and serene. A moderate amount of tobacco and alcohol appears to be harmless. One may suggest that conclusions drawn from a study of octogenarian survivors alone need to be checked by the observation of a large number of persons throughout life before those conclusions can be accepted as well established.

Having investigated in Chapter III the conditions of long life, the author devotes Chapter IV to a consideration of its value. In this chapter Dr. Biedert discusses the subject somewhat from a medical point of view, and Dr. Leon Zeitlin seeks to evaluate, on the one hand, the loss arising from excessive mortality, and, on the other, the gain accruing from the lengthening of life. To the numerous problems raised in this chapter it is sought to give quantitative solutions. These are ingenious and interesting. But, since many of the factors that go to make a human life valuable, even from the economic aspect, are not capable of reduction to numerical terms, too much importance should not be attached to the results of such calculations.

Chapter V deals with the mortality of pensioners and other persons living in retirement, and contains essays by Dr. H. Westergaard and Dr. J. Rahts. The general conclusions of the chapter tend to show, what is perhaps not altogether unexpected *a priori*, that the cessation of work may mean the shortening of life, and that early retirement from work is not always good. The sixth chapter gives a retrospect, and the final chapter a summary of the steps that might be taken by the State and society to extend the length of human life.

The book is highly suggestive. It emphasises the desirability of lengthening the working period—the economically productive period—of life, and urges that the State should, from the cradle to the grave, do as much as possible to maintain the health and efficiency of its citizens, rather than wait for their premature breakdown and retirement before attempting to aid them. How far the State should proceed in this direction is a question on which much diversity of opinion must prevail.

A.D.W.

5.—*Précis du cours de statistique générale et appliquée*. Par Armand Julin. 2^e Edition. Avec une préface par M. A. de Foville. xii + 242 pp., 8vo. Bruxelles: Misch and Thron; and Paris: Marcel Rivière, 1910.

The course of statistics here presented is elementary and non-mathematical. M. A. de Foville has contributed a short introduction, in which he describes statistics as being “to economic and social

meteorology what the barometer is to physical meteorology," and in which he dwells on the necessity of statistics to statesmen, merchants and other persons. The author, M. Julin, without engaging in a discussion as to whether statistics is a science or only a method, proceeds at once in his opening chapter to the definition that "Statistics is the science which by calculation arrives at a knowledge of the character of human societies, and the object of which is the study of the mass by means of an enumeration of the units which compose it." Outside the study of human society statistics is regarded as a method. Not quite half the book is then devoted to the consideration of certain aspects of the theory of statistics or to "general statistics," and the remainder to the art of statistics or "applied statistics." The chapters dealing with "general statistics" are concerned with the definition and limits of the science, and with the general principles governing the collection, examination, compilation, explanation and interpretation of numerical data or observations. The treatment is descriptive, and there is occasionally a tendency to make nominal rather than real distinctions. The mathematical side of statistics is left severely alone. The methods of fitting observations to curves of error, and of interpolation, and the theories of sampling and correlation are not discussed.

The second part of the book, which deals with practical statistics, though in many respects very cursory, contains a useful description and critique of some important bodies of statistics. Industrial censuses, statistics of agriculture, foreign commerce, transport and prices are examined as to their origin, scope and meaning, in some cases briefly, in others more in detail, and the main difficulties in their interpretation and use are indicated.

Speaking generally, the book may be commended to persons who desire to equip themselves with a few guiding principles in the handling of numerical data, and who require to know the main features of certain important published statistics. But it does not meet the need of those who wish to study the mathematical theory and methods of the subject. It should be mentioned that to each chapter is appended a short list of the principal authorities on the matters dealt with in the several chapters.

A.D.W.

6.—*La Concentration Industrielle et Commerciale en Angleterre*. Par Léon Sénéchal. xxviii + 240 pp., 8vo. Paris: Société des Publications Scientifiques et Industrielles, 1909.

The tendency to combination in industrial and trading enterprise has recently attracted the attention of economists in many countries. In the latest text-books it is now customary to devote a section or a chapter to this new development of business methods; and theory has shown its sensibility to the shaping influence of the environment of fact, amid which it has been conceived and is systematised, by endeavours more and more resolutely undertaken, and less and less imperfectly achieved, to formulate the principles which are likely to inspire and direct the action of monopolists turning to the best account the bargaining strength which they derive from combination.

This broad treatment of the subject as contained in general manuals has been supplemented by special monographs dealing with the detailed arrangements, and the particular causes, manifestations and results of such fresh varieties of economic organisation; and the treatise now before us is designed to place, for the first time, before French readers an authoritative and critical account of the movement as it has been developed in England. English students may accordingly enjoy the advantage of noting in Dr. S  n  chal's pages the way in which the past history, the existing state, and the future prospects, of the less developed form of combination in this country, distinguished by him as "association," and the more complete "amalgamation," present themselves to an industrious, unbiassed and acute observer. They will perhaps be gratified to learn that in his opinion the English type has on the whole succeeded hitherto in securing the good and in avoiding the evil attaching to this marked drift of the industrial and commercial age in which we live. From the most conspicuous failings at any rate of the American trusts the English combinations are generally exempt.

The scientific study, which has now been made by different economists in different countries, of these new developments has led to two conclusions which can be definitely affirmed. The one is that combinations have probably "come to stay," for they are the result which might have been expected from the conditions that have arisen. They are in this sense natural rather than abnormal. The second conclusion is connected with the first; for it is clear that the formation and the conduct of such trusts, or of looser kinds of combination, may conduce in some respects to the promotion of the public weal, although the risk of an injurious conflict of interests between those who wield, and those who are dependent on, the exercise of a monopoly can never be entirely absent, and is often obviously imminent and serious. Both these truths are aptly illustrated in the monograph before us; but, as we have said, Dr. S  n  chal is evidently disposed to think that in England the legal attitude, the economic environment and public opinion are such that we can reap the benefit and escape the disadvantage of industrial and commercial concentration. The same impelling motive to avoid a "cut-throat" competition has been present here as elsewhere, and similar economies have been achieved in buying and selling and in arranging the successive stages, or the simultaneous portions, of the process of production in such an effective manner as to ensure that the best capacity shall be put to the fullest and least costly use. But the malpractices of "watering" capital, of obtaining unfair preferences in railway rates over weaker rivals, and of venturing with impunity on fraud or extortion behind the shelter of a tariff, which are commonly ascribed to American combinations, have happily attained no notoriety or magnitude in England.

Yet, as our author shows, the tendency to combination is exemplified in most, if not all, of its varieties in the different branches of English industry and trade. In some, such as the iron industry, one direction may be generally followed, while in others,

like the textile manufactures, the movement may take a different trend; and, again, in other businesses such as wholesale or retail trade, a third form of combination may be found. Sometimes the development may be styled "vertical," and an attempt may then be made with success to bring under one control the whole of the successive stages of a manufacture from the extraction of the raw material from the earth to the offer for sale of the finished article. At other times and in other places a "horizontal" combination may comprise all or most of the undertakings engaged on one step only in the process. In one industry "amalgamation," resembling in its structure, though not in its history or behaviour, the American trust, may be found, while in another the looser form of combination similar to the German "cartel" may be discovered. The objects of the combination may vary from agreements respecting the output of the price to more or less thorough unity of control. All these differences are noted and appraised by Dr. S  n  chal in his informing and judicial essay; and he is, we think, to be congratulated on the pains he has successfully applied to an opportune and valuable discussion of what is perhaps the most significant, as it is certainly not the least widespread, phenomenon of the present day in business enterprise. He has linked fact with theory, and criticism with observations in a happy "combination" of his own.

L.L.P.

7.—*Les lois d'assurance ouvri  re    l'  tranger. Suppl  ment g  n  ral.* Par Maurice Bellom, ing  nieur en chef au corps des mines. 589 pp., la. 8vo. Paris: A. Rousseau. Price 15 fr. 1909.

This is the tenth and last volume of a monumental work, of which the first volume, on assurance against sickness, appeared in 1892, and was followed by six volumes on assurance against accidents, from 1895 to 1904, and by two volumes on assurance against invalidity, in 1905 and 1906. The work has on two occasions (1901 and 1907) been *couronn  * by the Academy of Moral and Political Sciences. The supplementary volume is not intended to bring the subject down to the present time, by discussing those new developments of it that, if they were to be adequately considered, would almost call for a republication of the work, but simply to furnish the authentic text of documents which had been announced as forthcoming in the preceding volumes, or which have been promulgated since the publication of those volumes and are closely connected with the subjects dealt with therein. The ten volumes, therefore, are intended to embody a complete view of the legislation on those subjects based on the principles that had been adopted by the various countries at the time the three parts of the series respectively were issued.

The supplementary volume contains nothing relating to legislation in Great Britain, though the recent Acts relating to workmen's compensation, friendly societies, and industrial assurances would appear to be relevant to the subjects of the work. It contains, with regard to sickness assurance, two laws made in Germany, one in Denmark, one in Hungary, a law, a decree, and two sets of model

rules from Luxemburg, and a law made in Sweden. With regard to accident assurance, it contains the Belgian law of December 24, 1903, with eleven royal decrees and a Government circular for its enforcement; the Hungarian law of April 9, 1907, and the Russian law of June, 1903, with numerous instructions and other illustrative documents. With regard to invalidity assurance, it contains a Belgian law of December 31, 1908, with two decrees and a scale of contributions; a Spanish law of February 27, 1908, with two sets of rules made in conformity with it; an Italian law of May 30, 1907, with rules and tables; and a law of March 2, 1907, made by the Canton de Vaud, in Switzerland, with a decree, rules, tables, directions as to the calculations to be made thereunder, and two sets of model rules.

We cannot but feel some disappointment that M. Bellom has not included in his elaborate and almost encyclopædic work on a difficult and complicated subject a full account of the recent legislation upon it in this country. The circumstance that that legislation is based upon principles and proceeds upon lines that are not those adopted in other countries would, so one would have imagined, have been rather an inducement to the learned author to discuss it than an argument for wholly passing it over. A comparison of the British enactments as to workmen's compensation and old age pensions, as well as of the British ideal of a friendly society, with those which prevail in other countries, would, we cannot but think, have greatly added to the instruction and information to be derived from M. Bellom's labours.

However that may be, and without further insisting on what he might have done, we may be sufficiently appreciative of what he has done, and may render our tribute of admiration to the great industry with which he has accumulated and presented to the public a vast mass of valuable documents.

E.B.

8.—*The family and the nation: a study in natural inheritance and social responsibility.* By W. C. D. Whetham, M.A., F.R.S., and Catherine Durning Whetham. 233 pp., 8vo. London: Longmans and Co. Price 7s. 6d. net. 1909.

The authors of this work, having found that the "train of ideas outlined therein has given unity to a host of previously unconnected observations," have published it in the hope of conferring a similar advantage on others.

The first few chapters are devoted to a sketch of the statistical methods of studying variation and inheritance, associated with the names of Galton, Pearson and their pupils, and of the work of Mendel and his followers. The authors' knowledge of modern statistical work is hardly adequate. Considerable prominence, for example, is given to the work of Johannsen on "Pure Lines," but no attention is directed to the fact, pointed out six years ago by Professor Pearson and the late Professor Weldon,² that Johannsen's statistical treatment of his material is open to serious objection.

² *Biometrika*, vol. ii, p. 499.

On p. 29 the authors write: "Where we are dealing with the small, continuous variations shown by the different individuals of a homogeneous species, the normal curve will express their distribution." All statisticians are aware that numerous examples of continuous variation in homogeneous material cannot be described by a normal curve of error. Many of the illustrations given of Mendelian inheritance are also dealt with uncritically.

The authors proceed to deal with examples of inheritance in man. Much of the information contained in these chapters is drawn from the works of Sir Francis Galton, and from other well-known sources. The sixth and seventh chapters, which treat of the rise and decline of families, contain much interesting information, mainly derived from the Dictionary of National Biography and from Galton's writings. The remainder of the work is devoted to a study of the birth-rate. The decline in fertility of "fit" stocks and the undiminished or enhanced fertility of "unfit" members of society is discussed at length, although little new light is shed on the problem. This section may be helpful to members of the general public, but will hardly be of much service to more advanced readers.

While the objects of this book are excellent, it will perhaps add little to Mr. Whetham's high scientific reputation. The authors' first-hand acquaintance with the methods and data of modern statistical science does not appear sufficient to permit of their making a really serious contribution to our knowledge of the complex problems involved. Further, there are some obvious defects both of manner and of matter. We quote a specimen of each kind. The authors write (p. 132): "It is perhaps arguable that a demand for certain forms of socialism, for the organisation of all industry by the State, and the assumption of public responsibility for the support of all workers, is a sign of a decadent population. If the competent have become too few and the incompetent too many, the incompetent cease to be able to obtain a living, and the resulting misery and distress make it necessary to provide for them." The economic theory of collectivism may or may not be sound, but it is surely unworthy of a scientific writer to dismiss the subject in this facile, not to say question-begging, way. Again, with regard to the difficulty met with in certain of our colonies, of obtaining a supply of persons willing to act as domestic servants, our authors write (p. 203): "It is a matter of common experience in older countries, with both those who employ domestic servants and those who undertake the office, that service in a well-regulated household is the best possible preparation for the duties of married life in after years." Lower down on the same page the authors say: "But, from the point of view of the community, a woman of ability is far better employed in giving birth to and educating able children than in cooking dinners and washing clothes—*work which, in the main, is suitable to a different type of mind and body.*" (The italics are ours.) It is hard to understand how work suitable to one type of body and mind can be the best possible preparation for duties appropriate to another type.

M.G.

9.—*Le blé et les céréales*. Par Daniel Zolla, Professeur à l'Ecole de Grignon, 1909, &c. 298 pp., sm. 8vo. Paris, 8 place de l'Odéon : O. Doin et fils, Editeurs.

This volume forms one of a series of publications now being issued as sections of the *Encyclopédie Scientifique*; a project of great magnitude and intended to embrace in the aggregate no less than 1,000 volumes grouped under 40 distinct divisions or "bibliothèques." The present treatise is but one of the group of 41 volumes dealing with economic questions, which as a whole is entrusted to the very competent direction of M. Daniel Bellet of the "Société d'Economie Politique" of Paris, aided by a talented array of distinguished writers, many of whose names stand in the ranks of honorary members of the Royal Statistical Society. Were the reviewer of the present volume intended to offer any criticism of the subjects of these volumes, it would be right to suggest that distinctively agricultural topics do not appear to be accorded a space at all commensurate with their importance in economic discussions. No one can, however, find fault with the ability of Professor Zolla to treat as he does here of wheat and the cereals.

The treatise, it must be remembered, is expressly written by a Frenchman for Frenchmen, and although the subject handled necessarily admits of more or less frequent excursions into the region of international grain-growing and the wheat trade generally, these are less exhaustively treated than might be looked for in the title, and mainly in their bearings on the French economic position. Some of the comparative tables omit important States, and fail in point of date to give the most recent figures. Nevertheless, as thus limited, the statistics handled and the economic conclusions reached, are of great and abiding interest, and in certain aspects peculiarly opportune for the study of English economists. Nowhere among the older nations can we find more apt experiments in the task of bread supply for a local population within the compass of its own territory than in France, where, alike by physical conditions and by long tradition, the production of cereals, and especially of wheat, is peculiarly characteristic of the native agriculture.

In cereals M. Zolla includes wheat, spelt, barley, rye, oats, maize, rice, millet and buckwheat, all but the last belonging to one botanic family. In France wheat alone occupies 47.9 per cent. of the cereal surface, and naturally dominates the interest of the volume. Of the whole cultivated area (woods omitted), the cereal-growing surface of France, which reaches 39 per cent. as against only 16 per cent. in this country, is not far different from that of its neighbours—37 per cent. in Belgium, 40 per cent. in Germany—and it does not reach the 60 per cent. of Russia. Cereals serve, it is here argued, a double purpose—of food for men and food for animals. In France 57 per cent. of the cereal surface—all the wheat and the small amount of mixed grains still grown, with half the rye, buckwheat and maize—is required for men; the remainder of the grain being required for domestic animals or industrial uses. After comparison with foreign conditions, M. Zolla lays stress

on the changes in area and production, and on the necessity of remembering the large share, often disregarded, of grain and straw which the maintenance of the live stock of the farms entails. In a series of interesting tables the average harvests of late years are compared with the past, and the resultant produce of French grain-fields is shown to have been raised from under 200,000,000 of hectolitres in 1834-43 to 263,000,000 hectolitres in 1896-1905. Wheat alone developed still more rapidly, averaging 115,000,000 hectolitres in the later, against 69,000,000 hectolitres in the earlier period; but oats have increased still more, and are now 92,000,000 hectolitres against 52,000,000 hectolitres. In bulk the rye, barley and mixed grain crops are all diminishing. Per hectare, it is claimed the wheat yield of France has been carried from 10 hectolitres in 1816-20 to $17\frac{1}{2}$ hectolitres in 1901-05; that is to say, although the author does not so tell us, from an acreage yield no more than we are accustomed to see to-day in India, Argentina and Australia to its present level. That level, which is equivalent to some 19 bushels per acre, is, it is true, a long way under what we can show in our 32 bushels here. But the wheat area of France is eight times our own, and covers regions not very suitable to the plant. Wide variations occur, as M. Zolla shows, in the yield in several Departments; some seem still to yield less than the early French average above quoted, while in the north the yields far exceed the average, and more nearly approximate to those of England, Belgium and Holland.

Some portion of this book is devoted to refuting the error that total value of the whole crop of cereals in grain or straw represents a corresponding receipt by French agriculturists. Even to obtain the gross valuation—the estimate of some *five milliards of francs* sometimes put upon this has to be reduced by the large demands which so great an acreage requires for seed, and by the still larger absorption of a great share of the nominal product in the maintenance of the stock of the farm, the manufacture of meat, and the supply of the essential manure. Here an estimate of under *three milliards* is suggested as likely to avoid the “double entry” which invalidates some guesses at the cereal-produced wealth of the rural owners, farmers, and labourers of France. The now distant agricultural inquiry of 1882 placed the gross agricultural produce of France, after deduction of the means of production, at $10\frac{1}{2}$ milliards of francs, whereof seven milliards was then ascribed to products of vegetable origin. With lowered values at later dates, and allowing some material gain in quantities produced, the bulk of the latter, which includes the produce of vineyards, forests, and industrial cultures, is thus well over what the cereals alone furnish.

It is to the volume itself the reader must be referred if he is to study the discussion of the effect of changing values on the relatively narrow balance or margin of profit which remains to the agriculturists after deducting from their gross products the whole expenditure incurred. The fall in prices since 1876-80 is here put at from 24 per cent. in the case of wheat and 26 per cent. in the case of rye to 19 per cent. for barley or maize and 14 per cent. for

oats. The effect on farm rents is illustrated by quotations from various "hospices." The relation of prices to production, and of the effect on the supply of the stationary nature of the French population, are all dealt with. Imports and exports of cereals are shown, and those for wheat alone traced in detail for nearly a century; but the data stop short of the most recent years. One might commend to the reader to refer on this point to M. Tisserand's still more recent address to the Société Nationale d'Agriculture de France at their sitting of November 17 last, where a striking picture is given of the latest figures of wheat imports, which have, as a matter of fact, fallen in 1908 below 750,000 quintals, compared with an annual average over the whole decennium, 1877-1896, of nearly 11,500,000 quintals. The increasing part which Algeria and Tunis now take is a striking feature. M. Zolla treats at some length of the "*régime douanier*," to which no doubt the French agriculturist owes much of his relative prosperity, and this discussion and the tables and graphic illustrations offered of the course of prices and difference of level between the English and French wheat averages are opportune as coming from a trustworthy French source at a time when these questions are somewhat hotly debated here.

Guesses at the presumed cost of producing wheat are condemned by M. Zolla, who, after numerous examples, demonstrates—what the practical English agricultural economist recognises—the impossibility of arranging in a farming balance anything like the accurate calculations possible in other industries, where there is no confusing rotation of crops where the raw material is purchased, and the expenditure of labour known, and its value no matter of mere estimate. In a notice of a work which one can recommend alike for the statistics it offers and the arguments it advances, it is not possible to follow each section in detail, but the careful treatment of the records of prices of wheat and flour respectively, the variations of price level and of stocks of grain, and the overwhelming importance to France of her own successive harvests, have deep interest for the student, who will also mark the opinion offered of a coming period of higher grain values in light of the increasing production of gold. The details as to the organisation of the Paris grain market are themselves an interesting study. We note, however, M. Zolla's refutation of the dogma that speculation and term bargains are in any way accountable for reduced prices, and only wish he had carried further than perhaps the official statistics he quotes would permit the conditions of the wheat industry in other countries than those here noted, both in this connection and as regards the future of the world's supply. P.G.C.

10.—Other New Publications.*

Bosco (Augusto). Lezioni di statistica raccolte e compilate da P. Mengarini e A. Tamburini. Parte 1^a Metodologia Statistica. Parte 2^a Svolgimento Storico della Statistica. 2 vols., 8vo. Rome: Loescher and Co., 1909. Price 16 lire.

[These two volumes are a compilation of the lectures and writings on statistics, with a bibliography, of the late Signor Augusto Bosco, who was Professor of Statistics at the Royal University of Rome. Signor Luigi Bodio contributes a short biography.]

Bourne (H. R. For). Notes on Egyptian affairs—No. 6. The administration of justice in Egypt. 1. The old materials; 2. Innovations and reconstructions (1882-1890); 3. Sir John Scott's work (1891-1898); 4. The past decade; 5. Present deficiencies and requirements. Edited, with a preface, by John M. Robertson, M.P. vi + 62 pp., 8vo. Messrs. P. S. King and Son, 1909. Price 6d.

[A critical study of English administration in Egypt.]

Croner (Dr. Johannes). Die Geschichte der agrarischen Bewegung in Deutschland. 269 pp., 8vo. Berlin: G. Reimer, 1909. Price 5s.

[A history of the agrarian movement in Germany and its influences on the German Customs tariffs.]

Greenwood (M., jun.). The problem of marital infection in pulmonary tuberculosis. 24 pp., 8vo. 1909.

—— A statistical view of the Opsonic Index. 11 pp., 8vo. 1909.

Greenwood (M., jun.) and *Thompson (T.)*. On meteorological factors in the aetiology of acute rheumatism. 10 pp., 8vo. 1909.

Greenwood (M., jun.) and *White (J. D. C.)*. A biometric study of phagocytosis with special reference to the "Opsonic Index." 25 pp., 1s. 8vo. 1909.

Guyot (Yves). Les préjugés économiques. 192 pp., sm. 8vo. Paris: F. Alcan, 1909. Price 1 fr.

[A study in the form of dialogue of some economic prejudices which the author seeks to dissipate. Among other subjects there are chapters on exchange, protection, balance of trade, work and wages, and taxation.]

Jeze (Gaston). Cours élémentaire de science des finances et de législation financière française. Nouvelle édition, fascicule I. xxviii. 528 pp., 8vo. Paris, 1909. Price 12 fr.

Leroy (Marime). Syndicats et services publics. Histoire de l'organisation ouvrière jusqu'à la C.G.T. Les syndicats ouvriers et la loi. La crise des services publics. Les associations de fonctionnaires. 321 pp., sm. 8vo. Paris: A. Colin, 1909. Price 3 fr. 50 c.

[A study of the great industrial strikes in France organised by the trade unions and of the unrest among certain classes of Government employés, as well as of the social movements which have led up to these events.]

Nicholson (J. Shield). A project of empire. A critical study of the economics of Imperialism, with special reference to the ideas of Adam Smith. xxv + 284 pp., 8vo. Messrs. Macmillan and Co., 1909. Price 7s. 6d.

* See also "Additions to the Library," pages 90 *sqq.*

Powell (Ellis T.). Practical notes on the management of elections 52 pp., 8vo. Messrs. P. S. King and Son, 1910. Price 1s. 6d. net.

[A useful book to those interested in the working of elections. Some illustrations of the way ballot papers are sometimes marked indicate the occasional difficulty of deciding in whose favour a vote has been given.]

Rutter (F. W. P.). The Insurance Institute of Liverpool. The evolution of a great profession. 38 pp., bound copy, sm. 8vo. [Liverpool] 1909.

[A review of the growth of the business of fire and life insurance companies during recent years.]

Scholefield (Guy H.). New Zealand in evolution. Industrial, economic, and political. With an introduction by the Hon. W. Pember Reeves, director of the London School of Economics. xxiv + 363 pp., 8vo. London: Unwin, 1909. Price 10s. 6d.

[An interesting general and historical account of New Zealand, in its political, social, industrial and commercial aspects. Such portions of the work which lend themselves to statistical treatment are adequately dealt with in that respect.]

Séailles (J.). La répartition des fortunes en France. 142 pp., 8vo. Paris: F. Alcan, 1910. Price 5 frs.

[An statistical study of the distribution of wealth in France, based upon the statistics of the French succession duties. The author suggests certain improvements in the French returns whereby valuable information required for the study of his subject would become available.]

Williams (Sydney Charles). The economics of railway transport. x + 308 pp., sm. 8vo. Messrs. Macmillan and Co., 1909. Price 3s. 6d.

[The substance of a course of lectures on the economics of transport. An attempt is made to show the relation of economic principles to railway working as an actual business. The volume, which also contains an historical survey and an economic analysis of the subject, is divided into two parts, dealing, on the one hand, with the production of railway transport, and on the other, with its distribution and consumption.]

Liverpool Economic and Statistical Society. How the casual labourer lives. Report of the Liverpool Joint Research Committee on the domestic conditions and expenditure of the families of certain Liverpool labourers. Liverpool: The Northern Publishing Co. 8vo. 1909. Price 1s.

[An interesting study of the social conditions of the working classes.]

France. La petite propriété rurale en France. Enquêtes monographiques (1908-09). 8vo. Paris: Imprimerie Nationale, 1909. Price 3 fr. 50 c.

[This comprises reports on small holdings and the division of the land in France for each of the Departments. Those most competent to report on the subject under its different aspects in each of the Departments were consulted. The result of the inquiries, so far as they can be tabulated, are summarised in several tables appearing at the end of the volume.]

——— Résultats statistiques du recensement général de la population, 4 Mars 1906. Tome i. Première Partie. Introduction. Population légale ou de résidence habituelle pour la France entière. 4to. Paris: Imprimerie Nationale, 1908.

[This portion of the report contains an introduction explaining the method of taking the census, with copies of the different schedules used. There is also a report by M. Levasseur as to the "dépouillement" of the

returns of births, marriages and deaths and of census returns, with a view to their greater utility for administrative purposes. In addition to the usual tables, there is an appendix of international tables, including a table of the population of the large towns of the world in 1800, 1850, 1880, 1890 and 1900].

Italy. Milan. Società Humanitaria. Origini, vicende e conquiste delle organizzazioni operaie aderenti alla Camera del Lavoro in Milano. lxxxvi + 502 pp., 8vo. Milano, 1909.

Netherlands. Etudes d'étiologie criminelle. No. 1. Les attentats aux mœurs. 63 pp., 8vo. 1909.

[The judicial statistics of Holland have included from time to time special studies on crime. It is intended in future to publish those studies separately. This publication, the first of the series, deals with sexual criminality. The next volume will deal with senile delinquency.]

Nomenclature des maladies (Statistique de morbidité.—Statistique des causes de décès) arrêtée par la Commission internationale chargée de la revision décennale de la nomenclature nosologique internationale (nomenclature Bertillon) dans sa deuxième session (Paris, 1er, 2, 3 Juillet 1909). 77 pp., 8vo. 1909.

British and foreign trade and industry. Statistical tables and charts relating to British and foreign trade and industry (1854-1908). (In continuation of certain tables and charts contained in the Returns Cd-1761 of 1903 and Cd-2337.) [Cd-4954.] 1909.

[This valuable collection of tables will be welcomed by those who had occasion to use the volumes of which this collection is a continuation. The tables are divided into eleven sections, to which are added a number of charts. It is intended to issue these returns at periodical intervals with such additions and amendments as may be required.]

Railways. Continental Railway Investigations. Report to Board of Trade on Railways in Austria and Hungary by Mr. C. H. Pearson and Mr. N. S. Reyntiens. [Cd-4878.] 1909.

CURRENT NOTES.

December, 1909, was, on the whole, a cheerful month for the business world, in spite of the near approach of a General Election. The Bank rate was reduced to $4\frac{1}{2}$ per cent. on December 9, which pleased everyone, including even those who grumblingly held that the reduction should have been made earlier. The Stock Exchange enjoyed a period of activity in more than one department which was as welcome as unexpected; the improvement in the home railway market was particularly gratifying, for many people had come to regard home railway stocks as quite hopeless. As a matter of fact, they are subject to the same law as all other securities; whether they will be bought or not is a question of yield, and consequently of price. For many years their prices have been too high relatively to their dividends, and investors have left them alone, preferring other securities which paid better. They declined very gradually because they were in the hands of very good holders, who were slow to change their investments, especially in a falling market; and it is only recently that prices have come into some sort of conformity with the ideas now prevalent as to what the yield of invested capital ought to be. Securities of another class have also been advancing, namely South and West African mining shares and rubber shares. Operations in these are, of course, largely speculative, and are in some cases reckless gambles, but a respectable number of properties represented by such shares are believed to be "sound propositions," to use an American expression, and many persons who would be indignant if accused of imprudence buy and hold them. They sometimes hold them too long.

The prospects of industry and trade at the end of 1909 were, on the whole, encouraging, and 1910 may fairly be expected to be a year of good and possibly prosperous business in most departments. After two months of comparatively dear money the Bank rate is once more at 4 per cent., having been reduced to that figure on January 6. It is hoped by many that it will soon move downwards again, but for the moment the likelihood of a further drop is not great, owing to the revived demand for gold for Paris and India. The Bank's reserve is not high enough to bear much depletion, and this has been recognised in the market by a distinct upward movement in the discount rate during the first week of January. Foreign demands for gold are still to be expected; various demands for new capital will come before the public during the next few weeks; and it is probable that large issues of Treasury bills will be a feature of the current quarter, in view of the anticipated retardation of the income-tax collection. The improvement of trade will also cause some increase in the inquiry for money; and it must be remembered that, as prices for commodities are higher than they were a year ago, as is shown by the index numbers of the *Economist* and Mr. Sauerbeck, more money is now needed to finance commercial operations than a year ago. The same observation applies to some descriptions of Stock Exchange securities.

Mr. Sauerbeck's index-number of prices for December, 1909, is 76·3, the average of the eleven years 1867-77 being taken as 100. The monthly index-number rose till May, when it attained the value 75·4, but fell slightly during the summer months, mainly under the influence of articles of food. It showed again a steady advance after September, making it at the end of the year 4 points or $5\frac{1}{2}$ per cent. higher than in December, 1908. Articles of food are nearly 3 per cent., materials 7 per cent. higher than a year ago, the latter largely influenced by the movement of cotton. Considering the commodities in smaller groups, the index-number for *vegetable food* (cereals, &c.) has risen from 68·0 in December, 1908, to 68·5 in December, 1909, or by 1 per cent.; *animal food* (meat and butter) from 85·6 to 87·0, or by 1·5 per cent.; *sugar, coffee, and tea* from 47·0 to 52·7, or by 12 per cent.; *minerals* from 87·9 to 90·6, or by 3 per cent.; *textiles* from 60·1 to 71·0, or by 18 per cent.; and other *sundry materials* from 75·3 to 78·4, or by 4 per cent. The average index-number for the year is 74, one point higher than in 1908, two points higher than the average of the decade 1899-1908, and 12 points above the average of the lowest decade 1890-99, but 6 points lower than in 1907, *cf.* Mr. Sauerbeck's article in the *Journal* for March last.

The trade returns for December further give indication of expanding trade. The value of imports for December, as will be seen from the statement below, has risen by nearly ~~£1,500,000~~ £1,500,000, as compared with a year ago, and the value of the total imports for the year is nearly 31,800,000*l.* in excess of the value for 1908. Of this increase over half is due to raw materials and

Imports.	December, 1909.	Increase (+) or decrease (-) in December, 1909, compared with December, 1908.	Twelve months ended December, 1909.	Increase (+) or decrease (-) in twelve months ending December, 1909, compared with twelve months ending December, 1908.
Imports, value c.i.f.—	£	£	£	£
I. Food, drink and tobacco	23,411,992	+ 1,807,098	254,333,628	+ 10,199,539
II. Raw materials and articles mainly unmanufactured	24,245,251	+ 1,035,228	220,153,047	+ 16,698,030
III. Articles wholly or mainly manufactured	12,871,293	+ 1,079,723	147,684,111	+ 4,598,514
IV. Miscellaneous and unclassified (including parcel post).....	257,347	+ 37,850	2,569,731	+ 290,947
Total merchandise.....	60,785,883	+ 3,959,899	624,740,517	+ 31,787,030
Imports of bullion and specie	6,792,189	+ 1,448,677	66,506,718	+ 10,034,515

articles mainly unmanufactured, an increase of which part, however, must be debited to the rise in prices during the year, to which reference is made above. The imports of raw cotton during the month amount only to 2·2 million cwt. as against 3·7 in December, 1908, but the total for the year is 19·5 million cwt. against 18·4, of the value of 60,300,000*l.*, as compared with 55,800,000*l.* As regards sheep and lambs' wool, the imports for the month were 83·5 million lbs. against 73·6 million lbs. in 1908, and for the year 803,000,000 lbs. against 719,000,000 lbs., the value being returned at 31,900,000*l.* in 1909 as against 28,000,000*l.* in 1908. The total value of imports for the year—624,700,000*l.*—exceeds that in any previous year save 1907, when the value reached 645,800,000*l.* As compared with that year, the imports of food have increased by 7,000,000*l.*, while the imports of raw materials have fallen by 21,400,000*l.*, and the imports of manufactures by 6,900,000*l.*

The value of home produce and manufactures exported in December is greater by 4,400,000*l.* than in December, 1908, an increment which has just sufficed to make the total exports of home produce for the year in excess of that for 1908 by a little over 1,275,000*l.* It will be seen that the chief increase in the totals for the year lies in exports of "food, drink and tobacco," while there are smaller increases in "manufactured articles" and "miscellanea," but these are partly counterbalanced by a fall in the value of raw materials (mainly coal), due largely, at least, to the fall in the price of coal. In quantity, the coal exported during the year rose from 62·5 to 63,000,000 tons; but the value of these exports was 39,500,000*l.* in 1908 and only 35,300,000*l.* in

Exports.	December, 1909.	Increase (+) or decrease (—) in December, 1909, compared with December, 1908.	Twelve months ended December, 1909.	Increase (+) or decrease (—) in twelve months ending December, 1909, compared with twelve months ended December, 1908.
	£	£	£	£
Exports, of produce and manufactures of the United Kingdom, value f.o.b.—				
I. Food, drink and tobacco	2,069,984	+ 80,664	23,627,458	+ 1,689,807
II. Raw materials and articles mainly unmanufactured	4,551,567	+ 238,872	50,782,779	— 1,599,720
III. Articles wholly or mainly manufactured	26,431,015	+ 3,892,121	297,303,812	+ 348,396
IV. Miscellaneous and unclassified (including parcel post)	737,331	+ 176,664	6,665,395	+ 837,137
Total produce, &c., of United Kingdom	33,789,897	+ 4,388,321	378,379,444	+ 1,275,620

Exports.	December, 1909.	Increase (+) or decrease (-) in December, 1909, compared with December, 1908.	Twelve months ended December, 1909.	Increase (+) or decrease (-) in twelve months ending December, 1909, compared with twelve months ended December, 1908.
Exports of foreign and colonial merchandise, value f.o.b.—	£	£	£	£
I. Food, drink and tobacco	1,065,897	+ 100,005	11,999,803	+ 1,120,447
II. Raw materials and articles mainly un- manufactured	6,244,048	+ 1,193,895	54,397,151	+ 9,087,063
III. Articles wholly or mainly manufactured	2,312,968	+ 154,869	24,694,951	+ 1,439,988
IV. Miscellaneous and unclassified (includ- ing parcel post)	12,008	— 374	273,560	+ 94,270
Total, foreign and colonial	9,634,921	+ 1,448,395	91,365,465	+ 11,741,768
Total, British, foreign and colonial	43,444,818	+ 5,836,716	469,744,909	+ 13,017,388
Exports of bullion and specie	5,375,501	+ 875,438	60,034,718	— 3,218,269

1909. There is a large rise in the exports for the month, in the value of "manufactured articles," amounting to nearly 3,900,000*l.*; but here again the rise in prices must be remembered. In exports of foreign and colonial merchandise there is an increase of 1,400,000*l.* for the month and 11,700,000*l.* for the year.

That the figures of imports and exports require further analysis than can be given here, and more detailed consideration of the influence of the rise of prices, is suggested by the figures for tonnage of vessels entered and cleared with cargoes:—

Shipping (foreign trade).	December, 1909.	Increase (+) or decrease (-) in December, 1909, compared with December, 1908.	Twelve months ended December, 1909.	Increase (+) or decrease (-) in twelve months ending December, 1909, compared with twelve months ending December, 1908.
	Tons.	Tons.	Tons.	Tons.
Total, British and foreign, entered with cargoes ...	3,332,461	— 4,965	40,315,942	+ 125,977
Total, British and foreign, cleared with cargoes ...	4,770,917	+ 312,665	57,194,486	+ 585,403

It will be seen that the tonnage entered in December last is slightly lower than in December, 1908, notwithstanding the increased value of imports, while the rise in tonnage cleared is by no means proportionate to the rise in the value of exports. The entries for the twelve months give similar results. The entries and clearances of vessels with cargoes are less than the record figures of 1907 by 1,086,568 and 650,450 tons, respectively.

The first volume of a new series, "Abstract and detailed tables showing imports according to countries of consignment and exports according to countries of final destination," supplementary to the "Annual Statement of the Sea-borne Trade and Navigation of British-India with the British Empire and Foreign Countries," has been issued by the Office of the Director-General of Commercial Intelligence in Calcutta. This step has been taken on the recommendation of the Committee on Indian Trade Statistics, which sat in 1905. Registration according to the "port of shipment" is supplemented by statistics of import trade according to the "country of consignment," and export statistics according to the "final port of destination" are similarly supplemented by data as to the country of ultimate destination. Both systems of registration are to be tried concurrently for five years. The country of consignment was defined by the Committee as the country from which the goods have come, whether by land and sea, or by sea only, without interruption of transit, save in the course of transshipment or transfer from one means of conveyance to another; and the country of final destination was defined by them on similar lines. The first volumes contain some interesting results of comparisons of the two methods of registration. Thus, in the case of imports, it is shown to what extent imports from each country are made up by consignments from various countries, and to what extent consignments from each country are made up by imports from various countries.

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the five weeks ending January 1, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Birth-rates.	Death-rates from all causes.
		Births.	Deaths.		
England and Wales (76 great towns)	16,445,281	36,648	25,290	23·2	16·0
Scotland (8 principal towns)	1,865,571	4,046	3,720	22·6	20·8
Ireland (Dublin registration area and 21 urban districts)	1,142,308	2,742	2,380	25·0	21·7

The birth-rates show no marked differences from those of the

corresponding weeks last year. The English and Irish death-rates also do not differ greatly from those of the corresponding weeks last year, but the rates for the eight principal towns of Scotland are considerably in excess of those for the corresponding weeks of 1908, which ranged from 15·2 to 19·6. This increase appears to be due in great part to deaths from bronchitis, pneumonia and pleurisy and in part to higher infantile mortality.

According to the Board of Trade *Labour Gazette*, the state of the labour market in November was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
November, 1909	416	696,415	45,569	6·5
October, 1909	416	694,930	49,664	7·1
November, 1908	268	644,770	58,349	9·1

As compared with a year ago, all the principal industries, except cotton-spinning, in which short time continued, showed an improvement. There was also a decline in employment in cotton weaving. Organised short time to the extent of 15½ hours per week was worked by mills spinning American cotton. Returns from firms employing 126,343 workpeople in the week ended November 20, 1909, showed a decrease of 3·8 per cent. in the amount of wages paid as compared with a month ago, and an increase of 1·0 per cent. as compared with a year ago.

The following returns relating to pauperism, from data supplied by the Local Government Boards in England, Scotland and Ireland, are also extracted from the Board of Trade *Labour Gazette* for December, 1909:—

Selected urban districts.	Paupers on one day in second week of November, 1909.				Increase (+) or decrease (−) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	80,089	44,722	124,811	261	+ 8	— 11
West Ham	5,115	11,859	16,974	226	+ 7	— 23
Other districts	73,054	124,031	197,085	211	+ 4	— 2
Scotland	11,190	34,844	46,034	218	+ 2	....
Ireland	15,595	12,209	27,804	250	+ 8	— 7
Total, November, 1909	185,043	227,665	412,708	228	+ 5	— 6

The Council of the Child-Study Society have for some time, in their efforts to advance our knowledge of child life, been looking for aid of a scientific character, and have approached Professor Karl Pearson, F.R.S., who has drafted a schedule for studying the factors influencing the social life of the child, which he desires to have filled in by heads of families or by teachers intimate with families. Particulars of father, mother, and at least two children are required. It is more important that the schedule should be filled up for families "of the upper-middle or professional classes." The schedules are being distributed through the branch secretaries of the society in London and in other large centres. An appeal is made to members of learned societies (literary or scientific), and to professional men and women, to assist this work by applying for a copy of the schedule and filling in the particulars. Schedules may be obtained from the head office of the Society, 90, Buckingham Palace Road, S.W.

The Commercial, Labour and Statistical Department of the Board of Trade has been divided into two separate Departments. Mr. G. R. Askwith, C.B., K.C., has been appointed Comptroller-General of the Labour Department, and Mr. G. J. Stanley, C.M.G., Assistant-Secretary in charge of the Commercial and Statistical Department.

Two interesting foreign appointments are announced. M. A. de Foville has been elected "secrétaire perpétuel" of the Académie des Sciences morales et politiques, and M. Yves Guyot succeeds M. M. G. de Molinari as editor of the *Journal des Économistes*. M. de Molinari, who was editor since 1881, retired at the end of October owing to failing health.

By the death of Dr. Nicholas Gerard Pierson, the Society loses one of the most distinguished of its Honorary Fellows. Dr. Pierson was born in 1839, and had been an Honorary Fellow of the Royal Statistical Society since 1896. Among the many public positions which he had occupied were those of Professor of Political Economy at the University of Amsterdam, President of the Bank of the Netherlands, and Minister of Finance. He was Prime Minister from 1897 to 1901. A fuller record of his career will appear next month.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Banker's Magazine. January, 1910—The progress of banking in Great Britain and Ireland during 1909. No. 1. Capital and reserve funds. The Lords, the Budget, and the People. Bankers' profits during the second half of 1909. Monetary review. Stock Exchange values.

Economic Journal. December, 1909—Shipping conferences: *Macgregor* (Prof. D. H.). The economics of boy labour: *Twiney* (R. H.). The Patents and Designs Acts, 1907: *Schuster* (George). Land as a free gift of nature: *Furnivall* (J. S.). Some aspects of an industrial combine: *Evans* (A. Dudley). The Swedish general strike: *Penson* (T. H.). The present state of working-class pensions in France: *Bellom* (Maurice). Obituary: Simon Newcomb: *Fisher* (Prof. Irving).

Financial Review of Reviews. January, 1910—The custodian trustee: *Smith* (F. E.) and *Williams* (E. E.). The investment of capital in foreign securities: *Freiburg* (Dr. Karl Diehl). The status of the Board of Trade: *Fithian* (Sir Edward). Geographical distribution of capital.

Journal of the Board of Agriculture. December, 1909—The agricultural resources of Argentina: *Gibson* (Herbert). Suggestions for pig-feeders. The British crops of 1909.

Journal of Institute of Bankers—

December, 1909—The president's inaugural address. Loans issued during the year.

January, 1910—Bankers' advances on Stock Exchange securities: *Butterworth* (A. R.).

Surveyors' Institution. Transactions. Session 1909-10—

Part 1—The opening address of the president, 1909 (on the land question): *Stenning* (Alexander Rose).

Part 2—Town planning systems: *Davidge* (W. R.).

UNITED STATES—

American Journal of Sociology, 1909. November—The problem of sociology: *Simmel* (George). Is an honest and sane newspaper press possible? Women in industry; the manufacture of boots and shoes: *Abbott* (Edith). A study of New England revivals: *Dike* (Samuel W.). A study of the Greeks in Chicago: *Abbott* (Grace).

Annals of American Academy of Political and Social Science—

November, 1909—Contains a series of papers by different authors on American business conditions in different industries.

January, 1910—Contains a series of papers by different authors on industrial and labour conditions in the Southern States of the United States.

UNITED STATES—*Contd.*

Bulletin of the Bureau of Labor, 1909—

May—Mortality from consumption in occupations exposing to municipal and general organic dust: *Hoffman (Frederick L.)*.

July—Women's trade union movement in Great Britain: *Busbey (K. G.)*. Cost of living of the working classes in the principal industrial towns of France. Earnings and hours of labor in British textile industries.

Journal of Political Economy, December, 1909—Proceedings of a conference on the teaching of elementary economics. The aim and content of a college course in elementary economics: *Wolfe (A. B.)*. The aim of a course in elementary economics: *Litman (Simon)*. Methods of teaching elementary economics at the University of Michigan: *Taylor (F. M.)*.

Political Science Quarterly, December, 1909—Social self-control: *Giddings (F. H.)*. The ballot's burden: *Beard (C. A.)*. State taxation and forest lands: *Robinson (C. F.)*. Readjustment of railway rates: *McCain (C. C.)*. Marxism versus Socialism. IV: *Simkhoritch (I. G.)*. Our South American trade: *Shepherd (W. R.)*. Record of political events: *Beard (C. A.)* and *Hayes (C. H.)*.

FRANCE—

Bulletin de Statistique, Ministère des Finances, November, 1909—Projet de loi portant création d'un service de comptes courants et de chèques postaux. Les successions en 1908. La situation financière des communes en 1908. Les hypothèques maritimes de 1892 à 1908.

Journal des Économistes, December, 1909—La concurrence limitée et ses effets: *Molinari (G. de)*. La crise anglaise: *Guyot (Yves)*. Prévisions commerciales, industrielles et financières pour 1910: *Davies (Joseph)* and *Hailey (C. P.)*. La liquidation des loteries: *Nouvion (Georges de)*. Le nouveau tarif des douanes à la Chambre des députés: *Cohen (M.)*. Travaux des chambres de commerce: *Rouzel (M.)*. Lettre des États-Unis: *Tricoche (G. N.)*. Mouvement scientifique et industriel: *Bellet (Daniel)*. L'état actuel de la question des retraites ouvrières en France: *Bellom (Maurice)*.

Journal de la Société de Statistique de Paris, December, 1909—Note sur le coût de la vie en Allemagne: *Cadoux (G.)*. Note sur la durée moyenne de la vie dans une petite ville de province: *Meuriot (Paul)*. Statistique des successions et donations: *Delamotte (G.)*. Chronique des questions ouvrières et des assurances sur la vie: *Bellom (Maurice)*.

La Réforme Sociale, 16th December, 1909—Le syndicalisme chez les ouvriers de l'agriculture: *Souchon (A.)*. La fuite des populations pastorales françaises: *Fabre (L. A.)*. Le travail des femmes à la campagne (dernier article): *Ardouin-Dumazet (M.)*. Les concours d'apprentis institués par le Conseil de prud'hommes de Nîmes: *Forard (Andre)*.

FRANCE—*Contd.*

Revue d'Economie Politique, November—December, 1909—Les valeurs mobilières et les projets de réforme fiscale: *Truchy* (Henri). L'infiltration des idées sociales dans la littérature économique allemande: *Philippovich* (Eugène de). La question du minimum de salaire dans l'industrie à domicile en Allemagne: *Leroy* (Jean). Chronique budgétaire et fiscale. Le budget de 1910: *Allix* (Edgard).

GERMANY—

Jahrbücher für Nationalökonomie und Statistik (Conrad's). December, 1909—Die Reichsfinanzgesetze von 1909: *Hesse* (A.). Ein Versuch zur Gewinnung einheitlicher Gesichtspunkte für den Ausbau und die Durchführung der Statistik der Fleischkleinhandelspreise: *Haucke* (H.). Uebersicht über Gummi. Produktion, Handel, Preise, Rentabilität. Rück- und Ausblick: *Freyer* (Cl. C.). Besteuerung des Unternehmers und des Arbeiters: *Herbig* (—). Die Jahresberichte der deutschen Gewerbeaufsichtsbeamten: *Kühler* (W.).

Zeitschrift für Sozialwissenschaft. Heft 12, 1909—Abschiedswort beim Rücktritt von der Redaktion der Zeitschrift für Sozialwissenschaft: *Wolf* (Julius). Zur Frage der Jugendgerichtshöfe: *Treu* (Max).

Zeitschrift des Königlich Preussischen Statistischen Landesamts, 1909—*Abth. III*—Entwicklung und Ergebnisse der Schlachtvieh- und Fleischbeschaustatistik in Preussen: *Petersilie* (Dr. Erich). Die preussischen Sparkassen im Rechnungsjahre 1907: *Evert* (G.). Der Viehstand in Preussen im Jahre 1908 mit einer graphischen Darstellung: *Petersilie* (Dr. Erich). Die tödlichen Verunglückungen in Preussen während des Jahres 1907.

ITALY—

Giornale degli Economisti. October, 1909—La semiologia economica a base statistica: *Benini* (R.). Ancora di municipalizzazione: *Montemartini* (G.). L'elemento giuridico nella scienza delle finanze: *Tangorra* (V.). La teoria dell'equilibrio economico secondo il Prof. Vilfredo Pareto: *Amoroso* (L.).

Riforma Sociale. November—December, 1909—L'opera di rinnovamento nella Sardegna. Il presente e l'avvenire: *Maggiolini* (U. V.). La piccola proprietà rurale in Russia: *Gayda* (Virginio). La crisi americana del 1907: *Garino* (Attilio).

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the three weeks ended January 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Argentine Republic—

Cordoba (Province). Campaña Agrícola, 1908-09. 8vo. 1909. (The Provincial Statistical Bureau.)

Belgium—

Catalogue de la Bibliothèque de la Commission Centrale de Statistique. Tome 5, 8vo. 1909. (The Administration of General Statistics.)

France—

Agriculture. La petite propriété rurale en France. Enquêtes monographiques (1908-1909). 8vo. 1909. (The Ministry of Agriculture.)

Census. Resultats statistiques du Recensement général de la population, 4 Mars 1906. Tome i. Première Partic. Introduction. Population légale ou de residence habituelle pour la France entière. 4to. 1908. (The Ministry of Labour.)

Labour. Conseil supérieur du travail. Session de 1909. La législation sur les syndicats professionnels. Rapport de M. Keufer au nom des membres ouvriers de la Commission permanente. Rapport de M. Tournon au nom des membres patrons de la Commission permanente. Procès-Verbaux et documents. 4to. 1909. (*Id.*)

— Enquête sur le placement des employés, ouvriers et domestiques à Paris depuis la promulgation de la loi du 14 Mars 1904. 8vo. 1909. (*Id.*)

— Enquête sur le travail à domicile dans l'industrie de la Lingerie. Tome III. Seine-Inférieure, Oise, Aisne, Somme, Pas-de-Calais, Nord, Meuse, Meurthe-et-Moselle, Vosges. 8vo. 1909. (*Id.*)

Société de Statistique de Paris. La Société de Statistique. Notes sur Paris. . . . 8vo. 1909. (The Society.)

Germany—

Census. Berufs- und Betriebszählung, 1907. Berufsstatistik. Abteilung I. Heft 2. Abteilung III. Die Bevölkerung Preussens nach Haupt- und Nebenberuf. 4to. 1909. (The Imperial Statistical Bureau.)

Bavaria. Die Massnahmen auf dem Gebiete der landwirtschaftlichen Verwaltung in Bayern, 1897-1903. La. 8vo. 1903. (The Board of Agriculture and Fisheries.)

Württemberg. Die Landwirtschaft in Württemberg . . . La. 8vo. 1902. (*Id.*)

Hamburg. Statistik des Hamburgischen Staates. Heft 24. Alter, Familienstand, Staatsangehörigkeit, Religionsbekenntnis und Geburtsort der Bevölkerung im Hamburgischen Staate (Volkszählung 1905. Teil 2). Ergebnisse der Bevölkerungsaufnahmen vom 1 November 1906, 1907 und 1908. Sterblichkeitstafel für den hamburgischen Staat für 1906. 4to. 1909. (The Statistical Bureau.)

Italy—

Justice. Notizie complementari alle statistiche giudiziarie penali degli anni 1896-1900. Svo. 1909. (The Director-General of Statistics.)

— Statistica Giudiziaria Penale per gli anni 1905 e 1906. La. Svo. 1909. (*Id.*)

Milan. Società Umanitaria. Origini, Vicende e Conquiste delle Organizzazioni operaie aderenti alla Camera del Lavoro in Milano. lxxxvi + 502 pp., Svo. Milano. 1909. (The Society.)

Netherlands—

Crime. Etudes d'étiologie criminelle. No. 1. Les attentats aux mœurs. 63 pp., Svo. 1909. (The Central Statistical Bureau.)

Elections. Kezersstatistiek benevens aanouling der Verkiezingsstatistiek in 1909. La. Svo. 1909. (*Id.*)

Roumania—

Civil Service. Fonctionnaires et retraites publics pendant l'année 1908-09. Fol. 1909. (The Ministry of Industry and Commerce.)

International—

Nomenclature des Maladies (Statistique de morbidité.—Statistique des causes de décès) arrêtée par la Commission internationale chargée de la revision décennale de la Nomenclature nosologique internationale (Nomenclature Bertillon) dans sa deuxième session (Paris, 1er, 2, 3 Juillet 1909). 77 pp., Svo. 1909. (Dr. J. Bertillon.)

(b) India and Colonies.**India, British—**

Supplement to Annual Trade Statement for year ending March 31, 1908. Abstract and detailed Tables showing imports according to Countries of Consignment and Exports according to Countries of Final Destination. Vols. 1 and 2, with prefatory Memorandum. First issue. 2 vols., fol. 1909. (The Director-General of Commercial Intelligence.)

Canada, Dominion of—

Royal Commission. Quebec Bridge Inquiry. Report, Minutes of Proceedings, and Plans to accompany the Report. 3 vols., Svo. 1908. (The Clerk of the House of Commons.)

New Zealand, Dominion of—

Forestry in New Zealand (prepared by the direction of the Right Hon. the Minister of Lands). By William C. Kensington, I.S.O., Under-Secretary of Lands. Fol. 1909. (The Department of Lands and Surveys.)

(c) United Kingdom and its several Divisions.**United Kingdom—**

Colonial Reports. No. 61, South Africa. Report on Agriculture and Viticulture in South Africa, by Lord Blyth. [Cd-4909.] Svo. 1909. (Purchased.)

— No. 62, Uganda Protectorate. Report on Introduction and Establishment of the Cotton Industry in the Uganda Protectorate. [Cd-4910.] Svo. 1909. (*Id.*)

Commercial Intelligence Committee. Report to Board of Trade by the Advisory Committee on Commercial Intelligence with reference to their proceedings (August 1905 to August 1909). [Cd-4917.] 1909. (*Id.*)

Defence. Imperial Conference. Correspondence and Papers relating to a Conference with Representatives of the Self-Governing Dominions on the Naval and Military Defence of the Empire. [Cd-4948.] 1909. (*Id.*)

Finance. The Lords' Debate on the Finance Bill, 1909, Reprinted from *The Times* of November 23, 24, 25, 26, 30 and December 1. 156 pp., 4to. 1909. (*Id.*)

(c) United Kingdom and its several Divisions—*Contd.*United Kingdom—*Contd.*

Labour. Report of His Honour Judge Ruegg, K.C., as to application of Factory and Workshop Act, 1901, to Florists' Workshops. [Cd-4932.] 1909. (*Id.*)

Railways. Continental Railway Investigations. Report to Board of Trade on Railways in Austria and Hungary by Mr. C. H. Pearson and Mr. N. S. Reyniens. [Cd-4878.] 1909. (*Id.*)

Trade. British and Foreign Trade and Industry. Statistical Tables and Charts relating to British and Foreign Trade and Industry (1854-1908). (In continuation of certain Tables and Charts contained in the Returns Cd-1761 of 1903 and Cd-2337.) [Cd-4954.] 1909. (The Board of Trade.)

(d) Authors, &c.

Bosco (Augusto). Lezioni di Statistica raccolte e compilate da P. Mengarini e A. Tamburini. Parte 1^a Metodologia Statistica. Parte 2^a. Svolgimento Storico della Statistica. 2 vols. 8vo. Roma. 1909. (Purchased.)

Bossi (L. M.)—

Malattie utero-ovariche e Malthusianismo. 53 pp., 8vo. 1909. (The Author.)

Des moyens de remédier à la fréquence de l'avortement criminel. 18 pp., 8vo. 1908. (*Id.*)

Les conséquences gynécologiques du Malthusianisme. 5 pp., 8vo. 1905. (*Id.*)

Bourne (H. R. Fox). Notes on Egyptian affairs—No. 6. The administration of justice in Egypt. 1. The old materials; 2. Innovations and reconstructions (1882-1890); 3. Sir John Scott's work (1891-1893); 4. The past decade; 5. Present deficiencies and requirements. Edited, with a preface, by John M. Robertson, M.P. vi + 62 pp., 8vo. 1909. (Messrs. P. S. King and Son.)

Croner (Dr. Johannes). Die Geschichte der Agrarischen Bewegung in Deutschland. 269 pp., 8vo. Berlin, 1909. (Purchased.)

Gibson (A. H.)—

Tariff Reform from a national standpoint. December, 1909. 77 pp., charts, 8vo. 1909. (The Author.)

Bank Rate. The Banker's Vade Mecum, third year of publication. January 1, 1910. 8vo. 1910. (*Id.*)

Greenwood (M., jun.)—

The problem of marital infection in pulmonary tuberculosis. 24 pp., 8vo. 1909. (*Id.*)

A statistical view of the Opsonic Index. 11 pp., 8vo. 1909. (*Id.*)

Greenwood (M., jun.) and *Thompson (T.)*. On meteorological factors in the aetiology of acute rheumatism. 10 pp., 8vo. 1909. (*Id.*)

Greenwood (M., jun.) and *White (J. D. C.)*. A biometric study of phagocytosis with special reference to the "Opsonic Index." 25 pp., la. 8vo. 1909. (*Id.*)

Guyot (Yves). Les Préjugés Économiques. 192 pp., sm. 8vo. 1910. (*Id.*)

Inglis (James C.). Address as President of the Institution of Civil Engineers. November 2, 1909. 17 pp., 8vo. 1909. (The Institution.)

Jèze (Gaston). Cours élémentaire de Science des Finances et de la Législation Financière Française. Nouvelle édition. Fascicule I. xxviii + 528 pp., 8vo. Paris, 1909. (Purchased.)

Lefèvre (W.). Free Trade and the woollen trade. Local industries. . . 16 pp., 8vo. 1909. (Mr. G. H. Wood.)

Leroy (Maxime). Syndicats et Services Publics. Histoire de l'organisation ouvrière jusqu'à la C.G.T. Les syndicats ouvriers et la loi. La crise des services publics. Les associations de fonctionnaires. 321 pp., sm. 8vo. Paris, 1909. (Purchased.)

Nicholson (J. Shield). A project of empire. A critical study of the economics of Imperialism, with special reference to the ideas of Adam Smith. xxv + 234 pp., 8vo. 1909. (Messrs. Macmillan and Co.)

(d) **Authors, &c.—Contd.**

- O (O.)*. Justice wanted! Modern thoughts on social problems. Chapter xiii—Taxation. 40 pp., 8vo. 1909. (Messrs. Swan, Sonnenschein and Co.)
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*On the RECENT CONSIDERABLE INCREASE in the NUMBER of
REPORTED ACCIDENTS in FACTORIES.*

By H. VERNEY, B.Sc.

[Read before the Royal Statistical Society, January 18, 1910,
Mr. NOEL A. HUMPHREYS, Vice-President, in the Chair.]

DURING the year 1908 there occurred on premises to which the provisions of the Factory and Workshop Act, 1901, applied no less than 122,154 accidents involving bodily injury to workpeople, 1,042 of which were fatal. In the Annual Report of the Chief Inspector of Factories for the year 1907 there appeared on page xxxii of Appendix I a tabulated statement (reproduced here in Table I) of the numbers of casualties annually reported to the inspectors under the Act by occupiers of such premises. The figures, which cover the period 1890 to 1907 inclusive, are graphically represented in Fig. 1. The most obvious thing about the curve A, representing the total number of reported accidents, is the very sharp and continuous increase in the annual number of reported accidents since 1895, an increase which, having regard to the fact that during the same period the inspectorate has grown both in numbers and (it may be said) in efficiency, calls for investigation.

It will be seen that up to 1895 some 9,000 accidents were annually reported, and that in the years immediately preceding 1895 the annual number increased, but not to any very great extent. From 1895 the number of reported accidents has increased enormously and well-nigh continuously. What, then, happened in 1895, or thereabout, which could account for this sudden and sustained increase in the number of factory casualties? Under the Factory and Workshop Act, 1878 (41 Vic., c. 16) an accident had to be reported, both to the inspector and the

certifying surgeon under the Act, which, occurring in factory or workshop, either—

“(a) Caused loss of life to a person employed in the factory or in the workshop; or

“(b) Caused bodily injury to a person employed in the factory or in the workshop, and was produced either by machinery moved by steam, water or other mechanical power, or through a vat, pan, or other structure filled with hot liquid or molten metal or other substance, or by explosion, or by escape of gas, steam or metal (and was of such a nature as to prevent the person injured by it from returning to his work in the factory or workshop within forty-eight hours after the occurrence of the accident).”

The portion within parentheses was repealed by the Factory and Workshop Act, 1891 (54 and 55 Vic., c. 75), and the following words were substituted:—

“And is of such a nature as to prevent the person injured by it from returning to his work in the factory or workshop and doing five hours’ work on any day during the next three days after the occurrence of the accident.”

It will be observed that the provisions of the 1891 Act were more comprehensive than those of the Act of 1878. A host of minor casualties occasioned by power-driven machinery and other plant was let into the class of reportable accidents, yet the curve shows no appreciable increase in the number of accidents in 1892, the first year of operation of the new Act. In the next year, 1893, there is a slight drop, co-incident with the coal strike, followed by increases in 1894 and 1895. The Act of 1895 (58 and 59 Vic., c. 37) altogether repealed the above provisions, substituting—

“(1) Where there occurs in a factory or workshop any accident which either—

“(a) Causes loss of life to a person employed in the factory or workshop; or

“(b) Causes to any person employed in the factory or workshop such bodily injury as to prevent him on any one of the three working days next after the occurrence of the accident from being employed for five hours on his ordinary work; written notice shall forthwith be sent to the inspector for the district.

“(2) If the accident causes loss of life, or is produced either by machinery moved by steam, water, or other mechanical power, or through a vat, pan, or other structure filled with hot liquid or molten metal, or other substance, or by explosion, or by escape of gas, steam or metal, then unless notice thereof is required under sec. 63 of the Explosives Act, 1875, to be sent to a Government inspector, notice thereof shall forthwith be sent to the certifying surgeon of the district.”

The main distinction is that after 1895 the class of non-fatal reportable accidents was not confined to those occasioned by power-driven machinery or the other kinds of plant specified, but included a vast number of injuries of all degrees of severity due to such causes as falls, blows struck by falling bodies, sudden overstrain, and so forth. But the newly-included accidents were to be reported to the inspectors only. The class of accidents which were required, after 1895 to be reported to both inspectors and certifying surgeons remained pretty much as it was left by the 1891 Act. But reports were now for the first time required from the occupiers of docks, wharves, quays, warehouses, certain laundries, places where power-driven machinery is used in the construction of buildings, or other structural work in connection with buildings, buildings over 30 feet high under construction or repair by means of scaffolding, and buildings over 30 feet high in which more than 20 persons, not being domestic servants, are employed for wages. The law as to the reporting of accidents then remained unaltered until 1907, when the Notification of Accidents Act, 1906 (6 Ed. VII, c. 53), came into force. The section of that Act with which we are immediately concerned runs as follows:—

“4. (1) Where any accident occurs in a factory or workshop
“which is either—

“(a) An accident causing loss of life to a person employed in
“the factory or workshop; or

“(b) An accident due to any machinery moved by mechanical
“power, or molten metal, hot liquid, explosion, escape of gas or
“steam, or to electricity, and so disabling any person employed in
“the factory or workshop as to cause him to be absent throughout
“at least one whole day from his ordinary work; or

“(c) An accident due to any other special cause which the
“Secretary of State may specify by Order, and causing such
“disablement as aforesaid; or

“(d) An accident disabling for more than seven days a person
“employed in the factory or workshop from working at his ordinary
“work, written notice of the accident, in such form and accompanied
“by such particulars as the Secretary of State prescribes, shall
“forthwith be sent to the inspector for the district, and also in
“the case of the accidents mentioned in paragraphs (a) and (b)
“of this section, and (if the Order of the Secretary of State
“specifying the special cause so requires) of accidents mentioned
“in paragraph (c), to the certifying surgeon of the district.”

Before considering the effect of this enlargement, in 1895, of the definition of a reportable accident and of the area from which the reports are to be gathered, the curious circumstance that the

extended scope of the definition of 1891 produced so little immediate effect on the number of accidents reported annually demands some explanation. As we have seen, the period of absence from work of the injured person necessary to make an accident reportable was in effect reduced from two whole days to five hours; and the more trivial accidents are, on the whole, the more numerous. A sufficient explanation is, I think, to be found in the slowness with which knowledge of new requirements comes home to the occupiers of factories and their agents. When legislation of this kind is engaging the attention of Parliament the ordinary newspapers convey practically no information and, if the proposed modifications of the law are general, affecting all manufacturing industries alike, the trade journals afford little more enlightenment. When important new provisions of the law come into operation it is usual for the Factory Department to send to everybody concerned explanatory printed matter, but it is to be feared that many of the recipients pay scant attention to it.

It is not likely that an unreported accident would come to the knowledge of the inspector, unless it were serious. Fatal accidents are investigated by the coroner, who is under obligation to notify the inspector. Hence it may be said that from one source or the other fatal accidents have always been notified, but that diminishing percentages of minor accidents and, to a less extent, of serious accidents fail to get into the returns, and that the full effect on the returns of a change in the definition of a reportable accident is, or at any rate was, at the period we are dealing with, only gradually arrived at in the course of, say, three or four years. It is possible also that these accidents due to power-driven machinery and the other kinds of plant give rise in general to injuries sufficient to prevent the injured person from doing his ordinary work for forty-eight hours or more. In this case we should hardly expect to find much effect on the returns. No doubt there is something in both these explanations.

In order to eliminate the disturbing effect of the changes introduced by the Acts of 1895 and 1906 we may deduct from the total accidents those which were not occasioned by power-driven machinery and the other classes of plant specified above; retaining, however, all the fatal accidents. The result is the curve C (Fig. 1). We may deduct also the accidents which happened in docks, warehouses, and buildings under construction or repair, and which were made reportable for the first time by the Act of 1895. Thus we arrive at the curve D. Both these classes of accident can be dealt with separately later on and the remainder, *i.e.* the ordinates of the curve D, are comparable throughout the period under consideration.

The curve D represents a most important class of accidents. It includes all the fatal and almost all the accidents involving serious bodily injury and a great many of the preventable accidents. Scrutinizing it closely we see that the discontinuity of 1895 has vanished. There is a slow rise in the number of accidents from 1893 onward; accelerated after 1895, probably by reason of the impression produced by the issue of instructions explanatory of the new Act, although accidents of the class we are now dealing with were reportable under the old Act; the rate of increase receiving a check in 1897, but recovering again in 1898 and continuing till 1900, then falling off in a marked degree till 1904, after which year there was again a marked and accelerated rise. What explanation can be offered of these peculiarities?

In the first place it may be noted that the growth in numbers and efficiency of the inspecting staff affects the accident returns in two ways. The increased attention given to the fencing of dangerous machinery is not without considerable effect in mitigating the risks of manufacturing operations, although this is hardly to be gathered from a hasty glance at our curve, because that does not distinguish between preventable and non-preventable accidents, and it is the latter class only that can be affected by the better fencing of dangerous machinery. On the other hand, increased vigilance of the inspectors leads to better reporting on the part of the occupiers of factories. There can be no doubt that, formerly, trivial accidents were frequently overlooked, or the reports were designedly withheld. For several years after the change in the definition of a reportable accident in 1895, the writer continually met occupiers who were under the impression that if the injured person was not incapacitated for more than three days the accident need not be reported, the minimum period of absence being, in fact, only five hours. This appeared to be due to a common mistake in interpreting the regulations. Inspection is now more frequent and thorough, and occupiers are better instructed in the provisions of the Act. Table II gives the numbers of inspectors of all grades for the years 1894 to 1908, together with the number of prosecutions instituted by them in respect of (*a*) unfenced machinery, and (*b*) failure to report accidents.

Again, the effect of fluctuations in the activity of manufacturing and of the gradual growth in the volume of manufacture which is found to underlie these fluctuations should be considered. For this purpose some quantity must be selected, which may serve as an index of the volume of manufacture, *e.g.*, the consumption of coal in the industries; the railway goods traffic returns; the clearing-house returns; and, when we are considering the particular industries, the quantity of cotton piece goods exported, the raw

cotton consumed, the tonnage of ships built, and so on—no one index, however, being entirely satisfactory as a measure of the activity of manufacturing. The annual values during the period we are dealing with of several of these quantities are given in Table III, and the annual percentage fluctuations are expressed graphically by the logarithmic curves in Fig. 2. It may be noted parenthetically that the coal consumption in the factory industries is somewhat difficult to ascertain. Mr. James Tonge, in a recent book,¹ gives an analysis of the total coal consumption of the country, from which Table IV has been abridged. The Royal Commissioners appointed in 1866 to inquire into the coal resources of the United Kingdom, reported in 1871 that “the present consumption of coal for “domestic use is generally estimated at one ton per head of “the whole population It is probable that this rate “per head will continue pretty constant; because although more “economical methods of using coal in dwellings may probably be “introduced, yet the increasing wealth of the nation will cause coal “to be more liberally used for domestic purposes. The future “increase of consumption under this head may therefore be “expected to coincide with the increase of population.” Since the time when this was written the gas stove has come into extensive use for domestic purposes, *i.e.*, the consumption of coal has to that extent been transferred from dwelling-houses to gas works, which are, of course, factories. The Census of Production (1907) gives the quantity of coal of household quality raised and retained for consumption in the United Kingdom as 51,543,000 tons, out of a total inland consumption of 182,914,000 tons. Hence, if from the figures representing the annual inland consumption of coal we deduct the percentage (arrived at as in Table IV) consumed by the railways, coasting steamers, and collieries, and also one ton per head of the population, representing the domestic consumption, we shall get a good idea of the consumption in the factory industries. The figures thus obtained are given in the second row of Table III, and in the following rows are given the annual values of some of the other quantities mentioned above as being likely indices of the state of trade. The numbers of workpeople employed in factories generally are, unfortunately, not to be had after 1904. In the case of textile factories a sharp rise occurs after 1904, and if this holds good for the non-textile factories also, some relation between the number of accidents and the number of persons employed is indicated.

It has not been thought necessary to plot the series of annual values given in Table III in diagrams on the natural scale, especially

¹ *Coal*, by James Tonge. Constable and Co., 1907.

as, in comparing curves thus plotted, we compare, or at least are very apt to compare, absolute increases and decreases in our quantities, whereas we are much more likely to elucidate any casual connections which may exist between the different series if we compare the percentage fluctuations, or the rates of increase or decrease. In Fig. 2, the percentage fluctuations of the annual accident total are compared in turn with the percentage fluctuations of the combined exports and imports, the exports alone, the consumption of coal in factories,² the clearing-house returns, and the railway goods traffic;³ the accident curve (dotted) being superimposed on each of the others. Incomplete curves, representing the percentage increase in the population and in the number of persons employed in factories, are also added. The vertical scale of the accident curve is then adjusted to each of the other curves until the closest possible correspondence is obtained; it is compressed, so to speak, in a vertical direction until it as nearly as possible fits each of the others in turn. The numbers at the margin indicate the amount of compression that has been applied, *e.g.*, in order that the accident curve should fit the coal curve as nearly as may be the ordinates of the accident curve must be reduced in the proportion of 1 to 0.20. This would seem to be legitimate, provided that, when comparing the curves, we do not forget the adjustment. We cannot expect the rate of increase shown by the accident curve to be the same as that shown by the other curves. We have done something if we can show that it is proportional. It is conceivable that a 10 per cent. increase of the persons employed in cotton mills during a spell of good trade, the new hands being raw and untrained and unaccustomed to machinery, may double the accidents. It will be noticed that there is a fairly close resemblance between the reduced accident curve (the chain line) and the goods traffic and coal consumption curves, particularly the former. The resemblance is less in the case of the clearing-house curve and still less in the case of the combined exports and imports and the exports alone, the last-mentioned curves being very similar. Accidents in factories due to power-driven machinery and the other kinds of plant above mentioned may therefore be said to increase with the railway goods traffic, but three times as fast. There is a similar increase in the consumption of coal in the factory industries, but here the accidents increase a trifle under five times as fast. If we gauge the activity of manufacturing by averaging all five of our index curves we may say that *accidents increase three times as fast as the volume of manufacture.*

² The coal curve is not quite accurately drawn, but the error is not sufficient to affect the argument appreciably.

³ See the *Railway News* of January 8, 1910, page 84, for an interesting note on the goods traffic returns as indices of the activity of trade.

Having already eliminated from the accidents curve the disturbing effect of the several changes in the definition of a reportable accident made since 1890, we may now endeavour to eliminate also the effect of better reporting on the part of occupiers of factories. It has already been suggested that in the early part of the period we are dealing with large numbers of accidents were never reported. It was seldom, however, that fatal accidents could fail to come to the knowledge of the inspector, and the returns of such may be taken to be complete, even in the early years of the period. Fig. 3 is a comparison of the curves representing the accidents in factories due to power-driven machinery and other plant, and the fatal accidents in factories, over the period 1895 to 1907 inclusive. The dotted curve is simply the fatal accident curve drawn to an increased vertical scale; stretched, so to speak, and so placed as to lie as nearly as possible over the first-mentioned curve. It is found to be necessary almost precisely to double the scale. All three curves are, of course, logarithmic. There is a fair amount of correspondence between the last-mentioned two curves. Hence, if the method is good, a 5 per. cent. increase in the fatal accidents corresponds to a 10 per cent. increase in machinery accidents generally. If, therefore, as is more than likely, the fatal accidents are fully reported, *one half of the rate of increase of accidents in general must be due to the increase in the volume of manufacturing.* It is known that new and untrained hands coming into a thriving industry are specially liable to accidental injury. During the recent boom in the cotton trade (1905 to 1907) mill managers had much difficulty in securing the full complement of workpeople. Large numbers of unskilled persons, mostly women and young persons, were imported into the cotton mills from Ireland, Liverpool, and other parts of the kingdom, where the labour of such persons was less in demand, and, although there seem to be no figures directly establishing the point, yet experience and common sense alike show that these people are much more liable to accidental injury, when employed in factories full of machinery with which they are unfamiliar, than the older hands. It is known also that in busy times pressure is exerted on the workpeople in order to secure the utmost production of which the mills are capable. The pace of the machinery is increased, and it is kept going as long as possible. The time allowed for cleaning the machinery while stopped is curtailed, and overtime and night work prevail. Moreover, and quite apart from booms in trade, the use of machinery is yearly becoming more general; handicraft after handicraft and process after process are absorbed by mechanical production.

By thus comparing the machinery accidents curve with the fatal accidents curve, both being on the logarithmic scale, we are able to

eliminate the unknown effect of better reporting on the rate of increase of reported accidents and so determine quantitatively the effect of the other factor, viz., increasing trade. Let us now eliminate in turn the effect of increasing trade. It happens, unfortunately, that the woollen, worsted and shoddy group of industries has remained practically stationary over the period under consideration, as may be inferred from the periodical returns of persons employed in these trades, which are briefly summarised in Table V. In Fig. 4 the annual number of accidents due to machinery, and certain other plant in woollen, worsted and shoddy factories from 1895 to 1908, inclusive, are plotted on the logarithmic scale. To this curve the general accidents curve is applied in the manner already explained in connection with Figs. 2 and 3. The closest possible correspondence between the two is secured by almost exactly halving the ordinates of the latter. That is to say, having eliminated the effect of increasing trade, we find that *one half of the rate of increase of machinery accidents in general is to be attributed to better reporting.* But we found just now that the other half is due to increasing activity in trade. It seems, therefore, that we have completely and quantitatively accounted for the shape of our accident curve, that is to say, for that striking and sustained increase in the number of reported accidents which has been the subject of much speculation. Better reporting is due, to some extent, to more frequent inspection, as we have already seen. The effect of the Workmen's Compensation Act on the notification of accidents should also be observed. Previously to the Compensation Act of 1897, many minor casualties never came to the knowledge of the occupier, let alone the factory inspector. From 1896 to 1906, inclusive, the period of absence necessary to constitute a reportable accident was five hours. Cases in which a factory operative, having suffered some trifling injury, would go home for half a day without the fact becoming known to the occupier or manager, would formerly be numbered by thousands annually. And when there was little chance that during the worker's absence his wage would be paid him he took care that his absence was not unduly prolonged. Since the Compensation Act, however, the pecuniary interest of both employer and employed operates the other way. The employer insures himself, and takes good care that every injury for which he may be liable to compensate the injured person is promptly brought to the notice of his insurance company. At the same time he is reminded of his obligation to report the matter to the factory inspector. In some cases the insurance company as well as the law requires him to do so. It is obvious that if the employer has contributed to the accident

by neglect of the provisions of the Factory Act it is important that the insurance company should be aware of the fact, since it may affect their liability under the contract of insurance. The workman, too, is alive to the advantages conferred on him by the Compensation Act and does not allow his employer to forget that he is entitled to compensation, nor is there the same incentive to the workman to return to his work as soon as he is able. There is, of course, a minimum period of absence laid down by the Act, below which no compensation is payable, but it is believed that the above considerations have operated on the notification of accidents entailing less, as well as greater, absences than the minimum.

The results obtained above have been checked by the employment of a different, though related⁴ method, which may perhaps be considered worthy of notice in itself. Let y be the value for any year of any of the quantities set out in Table III, and let Δy be the increment by which it is exceeded by the corresponding value in the succeeding year. Then $\frac{\Delta y}{y}$ may be called the proportionate rate of increase, and it affords a convenient method of comparing two or more series. By way of illustration, the annual figures for goods traffic, coal consumption, and the other quantities are again set out, together with the differences (or increments) between consecutive values and the ratios $\frac{\Delta y}{y}$, in Table VI. The average of the annual proportionate rates of increase in the goods traffic is 0.034, or 3.4 per cent.; of the C.S. accidents, 10.3 per cent., or three times as great, which is the result we obtained by the previous method.

The ratios $\frac{\Delta y}{y}$ may be expeditiously computed with the aid of a slide rule, and if two or more series are plotted to a suitable vertical scale, the diagram exhibits very clearly the relations subsisting between them. For example, an examination of the curve representing the rate of increase of accidents due to better reporting seems to indicate that, on the average, the rate falls 2 per cent. per annum for about four years.

Before going further it may be well to recapitulate the main points of the foregoing discussion of factory accidents in general. In our original curve (D, Fig. 1) we note first of all the slight effect of the Act of 1891, which lowered the period of absence from work necessary to make a machinery accident reportable from forty-eight hours to five hours, doubtless because most machinery

⁴ In the limit the relation is $\frac{d(\log y)}{dy} = \frac{1}{y}$.

accidents necessitate a much longer absence than five hours, and because many accidents, by design or inadvertence, were never reported. The effect of the coal strike of 1893 is apparent, converting what ought to have been a rise into a drop, which accentuates the subsequent rise to 1895, during which period, and right on to the present, a growing proportion of the total accidents was reported. From 1893 to 1907 there is a practically continuous increase, interrupted only in 1904. From 1896 to 1900 the curve is convex to the base line, that is, the rate of increase is diminishing. From 1904 the rate increases again. These features, we have seen, are due to the fluctuating activity of trade, to the steady increase in the volume of trade underlying the fluctuations and to better reporting. While machinery accidents actually increase one and a-half times as fast as the volume of manufacture, owing to better reporting they apparently increase three times as fast. By the Notification of Accidents Act, 1906, a change was again made in the definition of a reportable accident, the period of absence in the case of machinery accidents being one whole day, and in the case of non-machinery accidents, not fatal, anything more than seven days. The effect of this is already apparent on the curve B, but on the curve we have been dealing with chiefly it cannot yet be distinguished.

The accidents we have been dealing with so far are those reportable to both certifying surgeons and inspectors and occasioned by power-driven machinery and certain other plant. The reason for dwelling on this particular class of accidents was that it was desired to eliminate, so far as possible, changes in the legal definition of a reportable accident, so that the separate effect of other causes affecting the accident returns could be studied. But these machinery accidents (or C.S. accidents) are particularly worthy of study for other reasons. They oftener give rise to serious bodily injury, and they afford more scope for the operation of preventive regulations. We have frequently alluded to them briefly as factory machinery accidents. Now although, of premises under the Factory and Workshop Act, power-driven machinery exists only in factories and in the docks, buildings and other places covered by sections 104 and 105, yet vats, pans and other structures filled with hot liquid, or molten metal or other dangerous substances are often to be found in workshops; and explosions and escapes of gas may occur in workshops as well as in factories. Accidents due to these causes, occurring in workshops and involving the prescribed amount of bodily injury, are reportable to the certifying surgeon, and so are fatal accidents, which may, and do, occur in workshops as well as in factories. All these are included in the

class we have alluded to as "factory" accidents. They are so few that it would hardly be worth while taking the trouble to separate them from the true factory accidents. In the more recent Annual Reports of the Factory Department, workshop accidents are apparently not distinguished. In 1904, however, 151 were recorded, 5 of which were fatal; the corresponding figures for 1903 being 211 and 6 respectively. Going back to 1897, we find that there were 80 workshop accidents, 3 of which were fatal. Now in 1896 the registered workshops numbered 81,669 and 655,565 persons were employed in them. In 1904 the number of registered workshops was 140,792, and to these we must add 19,496 workshops in which men only were employed—a class of workshops which was then far from being completely registered. In the Annual Report of the Chief Inspector of Factories for 1905 it is stated that the number of persons employed in workshops (excluding the men's workshops and workshop laundries) was approximately 700,000. We can hardly suppose that the few accidents enumerated above are a complete statement for so many workplaces involving so many workpeople. The workshop accident returns must fall considerably short of the truth. Omissions to report are more likely in workshops where the occupiers are often illiterate and generally less acquainted with the requirements of the law as to accidents, no doubt largely because accidents in any one workshop are infrequent occurrences. If we inquire as to the nature of the few accidents that are reported from workshops we find that most of them arise in connection with machinery other than power-driven machinery. The very few that are fatal are due to hot liquid, &c., escaping from vats or pans. These accidents being reportable to the certifying surgeons, are entirely negligible for our present purpose, and the argument is in no way affected by their inclusion in the factory returns. Thus, in 1904, of the 151 accidents reported from workshops, only 12 were reportable to the certifying surgeon.

Let us now deal with the host of accidents, not fatal and not caused by machinery moved by mechanical power, or by hot liquid or molten metal, or explosives, or escape of gas, and consequently not reportable to the certifying surgeon, but to the inspector only. Such are falls, blows struck by falling bodies or by tools, sprains, cuts, scratches, bruises and so on, of all degrees of severity and, up to 1907 it might also have been said, of triviality. They were made reportable for the first time by the Factory and Workshop Act, 1895, and their subsequent annual numbers are given in Table I and expressed graphically by the curve B in Fig. 1. The minimum period of absence from the injured person's ordinary work necessary to make an accident of this class reportable was five hours on any one

of the three working days next after the accident; and very trivial accidents indeed were therefore made reportable. This standard was not altered by the Act of 1901, but the Notification of Accidents Act, 1906, laid down that the period of absence must exceed seven days. The curve B of Fig. 1 is, in Fig. 5, plotted on the logarithmic scale, so that we may study the rate of increase. We find the average rate of increase to be about 1·3 times as great as that of the C.S. factory accidents, and these we found to increase, on the average, three times as fast as the volume of trade. The effect of the Notification of Accidents Act in checking the rate of increase appears in the decided drop in the curve G in 1907. We cannot very well subject these accidents to the same graphical analysis as we applied to the C.S. accidents. We have a much shorter period free from alterations of the statutory definition. We cannot compare them with the woollen trade returns, because most of the accidents reported by that trade are C.S. accidents and the remaining figures are so small as to render statistical methods hardly applicable. Further, the classification of these accidents according to industry in the annual reports of the Factory Department ceases in 1904. Perhaps we shall not be far wrong if we assume that *as the volume of trade increases, the actual increase of these accidents is the same as that of the C.S. accidents, viz., one and a-half times as fast as the volume of trade, but that the apparent increase as deduced above is four times as fast, the difference being due to better reporting.*

The residue of the original curve A, Fig. 1, is the class of accidents happening in docks, wharves, quays, warehouses, and buildings, and made reportable for the first time by the Act of 1895. The only object in separating them from the rest was to isolate and study the important class of accidents reportable to the certifying surgeons, free, between 1890 and 1906, from any alteration in the definition of a reportable accident. In this paper it is not proposed to examine them further.

Mention may finally be made of the new class of "dangerous occurrences" made reportable for the first time by the Notification of Accidents Act, 1906. Section 5 of that Act is as follows:—

"5. (1) If the Secretary of State considers that, by reason of
"the risk of serious injury to persons employed, it is expedient that
"notice should be given under the Act in every case of any special
"class of explosion, fire, collapse of buildings, accidents to machinery
"or plant, or other occurrences in a mine or quarry, or in a factory
"or workshop, including any place which for the purpose of the
"provisions of the Factory and Workshop Act, 1901, with respect
"to accidents is a factory or workshop, or is included in the word
" ' factory ' or ' workshop,' or is part of a factory or workshop, the

“ Secretary of State may by Order extend the provisions of this Act
“ requiring notice of accidents to be given to an inspector to any
“ such class of occurrences, whether personal injury or disablement is
“ caused or not, and, where any such Order is made, the provisions
“ of this Act shall have effect as extended by the Order.”

The provisions of the Act were accordingly extended, on December 22, 1906, to the following classes of occurrence whether personal injury or disablement is caused or not, viz. : all cases of

bursting of a revolving vessel, wheel, emery wheel, or grindstone
moved by mechanical power ;

breaking of a rope, chain, or other appliance used in raising or
lowering persons or goods by aid of mechanical power ;

fire affecting any room in which persons are employed and
causing complete suspension of ordinary work therein for not
less than 24 hours.

In 1908, 758 such occurrences were reported, and in 1907, 592 ;
but these numbers are certainly far below the truth. Of some half
dozen reportable fires which occurred in the writer's district in
1908 not one was duly reported.

APPENDIX.

TABLE I.

Year.	Accidents reported to				Total.
	Inspectors and certifying surgeons.			Inspectors only.	
	Factories and workshops.	Other premises.*	Total.		
1890†	484 8,211	—	484 8,211	—	8,211
'91†	420 8,527	—	420 8,527	—	8,527
'92†	420 8,643	—	420 8,643	—	8,643
'93†	422 8,186	—	422 8,186	—	8,186
'94†	448 9,749	—	448 9,749	—	9,749
'95	455 10,466	—	455 10,466	—	10,466
'96	525 14,164	71 269	596 14,433	19,124	33,557
'97	516 15,446	142 539	658 15,985	24,489	40,474
'98	577 18,493	150 734	727 19,227	38,335	57,562
'99	681 21,556	190 1,215	871 22,771	47,989	70,760
1900	813 25,970	232 1,734	1,045 27,704	51,316	79,020
'01	782 27,215	253 2,052	1,035 29,267	54,493	83,760
'02	850 27,748	260 2,328	1,110 30,076	60,279	90,335
'03	748 28,122	299 2,387	1,047 30,509	62,091	92,600
'04	727 27,574	291 2,387	1,018 29,961	63,007	92,969
'05	775 29,538	288 2,464	1,063 32,002	68,607	100,609
'06	799 32,902	317 2,794	1,116 35,696	76,208	111,904
'07	850 40,310	329 3,768	1,179 43,478	80,847	124,325
'08‡	767 39,643	275 2,258	1,042 41,901	80,253	122,154

Note.—The small figures (484) relate to fatal accidents and are included in the larger figures.

* Docks, buildings, &c., added by the Act of 1895.

† Twelve months ending October 31.

‡ The figures for 1908 were published after the paper was written, and are not included in all the diagrams.

TABLE II.—*Number of inspectors, prosecutions, &c.*

Year.....	1894.	1895.	1896.	1897.	1898.
Inspectorate	88	96	110	110	116
Prosecutions for failing to notify accidents	—	29	34	51	51
Prosecutions for failure to fence dangerous machinery }	95	125	94	153	141
Year.....	1899.	1900.	1901.	1902.	1903.
Inspectorate	132	139	141	138	152
Prosecutions for failing to notify accidents	44	56	61	42	36
Prosecutions for failure to fence dangerous machinery }	139	136	198	213	207
Year.....	1904.	1905.	1906.	1907.	1908.
Inspectorate	154	154	163	165	200
Prosecutions for failing to notify accidents	45	36	41	41	44
Prosecutions for failure to fence dangerous machinery }	253	295	294	278	317

TABLE III.—*Activity of trade and factory accidents, 1890-1903.*

Year	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
Consumption of coal in } factories ... Million tons }	884 76·4	886 77·0	872 74·6	820 66·2	885 76·8	888 77·4	903 80	912 81·6	910 81·2	948 88·8
Exports to foreign coun- } tries... Unit=1,000,000. }	505 320	509 323	480 302	464 290	447 280	476 299	498 315	507 321	525 335	543 349
Exports and imports } Unit=1,000,000. }	862 728	871 742	843 698	832 679	823 666	846 701	873 747	883 763	906 805	917 826
Railway goods traffic } Million tons }	—	490 309	490 309	467 293	511 324	523 334	551 356	573 374	579 379	617 414
Clearing House returns ... } Unit=1,000,000,000. }	893 780	836 685	811 648	811 648	802 634	880 759	879 757	874 749	908 810	961 915
Persons employed in fac- } tories Millions }	—	—	—	—	—	3·56	3·74	3·81	3·93	594
Population United King- } dom Millions }	—	—	—	—	—	39·3	39·6	40·0	40·4	40·8
Accidents in factories due } to machinery and plant }	914 8,211	931 8,527	937 8,643	913 8,186	989 8,749	1,020 10,466	1,151 14,164	1,189 15,446	1,267 18,493	1,333 21,556

Year	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
Consumption of coal in } factories ... Million tons }	961 91·4	934 86	957 90·6	955 90·2	953 89·8	956 90·4	973 94	1,009 101·6	—
Exports to foreign coun- } tries... Unit=1,000,000. }	559 362	549 354	549 354	589 388	606 404	652 449	716 520	763 579	—
Exports and imports } Unit=1,000,000. }	950 890	943 877	947 885	973 940	981 956	1,004 1,012	1,053 1,130	1,093 1,237	—
Railway goods traffic } Million tons }	628 425	619 416	640 437	647 444	653 450	664 461	689 489	712 516	—
Clearing House returns ... } Unit=1,000,000,000. }	952 895	981 956	1,000 1,000	1,004 1,012	1,023 1,056	1,090 1,229	1,104 1,271	1,105 1,273	—
Persons employed in fac- } tories Millions }	—	617 4·14	—	—	612 4·09	—	—	—	—
Population United King- } dom Millions }	41·1	41·5	41·9	—	—	—	—	44·5	—
Accidents in factories due } to machinery and plant }	1,414 25,970	1,435 27,215	1,443 27,748	1,449 28,122	1,440 27,574	1,470 29,538	1,517 32,902	1,605 40,310	39,643

Small figures (884) are the logarithms, characteristic figures only.

TABLE IV.—*Coal consumption in United Kingdom (Tonne).*

	Million tons.	Percentage of total consumption.
Coal consumption in the industries for the generation of—		
Power—		
Railways.....	14	8.45
Coasting steamers	8	4.82
Collieries.....	12	7.22
Factories	41	24.70
Heat—		
Blast furnaces	19	11.42
Steel and malleable iron works	13	7.83
Other metallurgical works	2	1.21
Chemical works, potteries, glass works	6	3.62
Gas works	16	9.63
Domestic consumption	35	25.10
Total	166*	100.0

* Of the quantity raised 183,000,000 tons were retained in U.K. in 1907.
(Census of Production.)

TABLE V.—*Persons employed in the woollen and worsted trades.*

1895.	1896.	1897.	1898-99.	1901.	1904.	1907.
282,400	284,000	266,000	256,000	260,000	262,000	261,000

TABLE VI.—*Fluctuations in rate of increase of C.S. accidents and trade.*

Year.....	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.
Coal consumption.....	76'4	77'0	74'6	66'2	75'8	77'4	80'0	81'6	81'2
Differences		0'6	— 2'0	— 8'4	10'6	0'6	2'6	1'6	— 0'4
$\Delta y \div y^*$		'0079	—'0031	—'112	160	'0078	'034	'020	—'0049
Exports.....	320	323	302	291	280	299	315	321	335
Differences		3	— 21	— 11	— 11	19	16	6	14
$\Delta y \div y$		'00938	—'065	—'0364	—'0377	'0678	'0535	'0190	'0435
Exports + imports	728	742	698	679	666	701	747	763	805
Differences		14	— 44	— 19	— 13	35	46	16	42
$\Delta y \div y$		'0192	—'0593	'0273	'0192	'0525	'0'656	'0214	'0550
Goods traffic		309	309	293	324	334	356	374	379
Differences		—	0	— 16	31	10	22	18	5
$\Delta y \div y \uparrow$		—	0	—'0519	'106	'0309	'0660	'0505	'0134
Clearing House returns	780	685	648	648	634	759	757	749	810
Differences		— 95	— 37	0	— 14	125	— 2	— 8	61
$\Delta y \div y$		—'122	—'054	0	—'0216	'198	—'00263	—'0106	'0814
Average $\Delta y \div y$ (Fig.) \ddagger		—'0227	—'046	—'0535	'0485	'0723	'0437	'0207	'0389
C.S. accidents.....	8,211	8,527	8,643	8,186	9,749	10,466	14,164	15,446	18,493
Differences		316	116	— 457	1,563	717	3,698	1,282	3,047
$\Delta y \div y$ (Fig.) \S		'0387	'0136	—'0529	'192	'0736	'354	'0909	'197

Year	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
Coal consumption.....	88'8	91'4	86'0	90'6	90'2	89'8	90'4	94'0	101'6
Differences		2'6	— 5'4	4'6	— 0'4	— 0'4	0'6	3'6	7'6
$\Delta y \div y^*$.. .		'094	—'059	'053	—'0044	—'0044	'0067	'040	'081
Exports.....	349	362	354	354	388	404	449	520	579
Differences		14	— 8	0	34	16	45	71	59
$\Delta y \div y$		'0418	—'0221	0	'086	'0413	'117	'158	'114
Exports + imports	826	890	877	885	940	956	1,012	1,130	1,237
Differences		21	— 13	8	55	16	56	118	107
$\Delta y \div y$		'0261	—'0146	'00914	'0622	'0170	'0585	'1163	'095
Goods traffic	414	425	416	437	444	450	461	489	516
Differences		35	— 9	21	7	6	11	28	27
$\Delta y \div y \uparrow$		'0925	'0266	'0504	'0160	'0135	'0245	'0607	'0553
Clearing House returns	915	896	956	1,000	1,012	1,056	1,229	1,271	1,273
Differences		105	— 19	60	44	12	44	173	42
$\Delta y \div y$		'13	'0207	'067	'046	'012	'0436	'165	'0341
Average $\Delta y \div y$ (Fig.) \ddagger		'0785	—'0083	'0296	'0372	'0231	'0771	'0833	'0646
C.S. accidents.....	21,556	25,970	27,215	27,748	28,123	27,574	29,538	32,902	40,310
Differences		3,063	1,245	533	374	— 548	1,964	3,364	7,408
$\Delta y \div y$ (Fig.) \S		'166	'048	'0196	'0135	—'0195	'0712	'114	'225

* Average 1890-1907, 0'020.

† Average 1890-1907, 0'034.

‡ Average 1890-1907, 0'0306.

§ Average 1890-1907, 0'103.

FIG. 1.

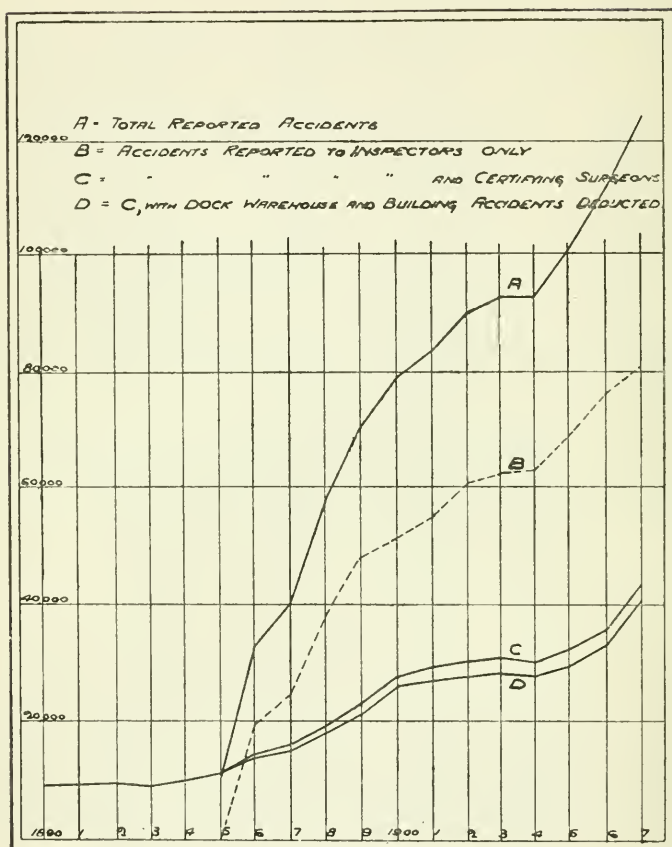
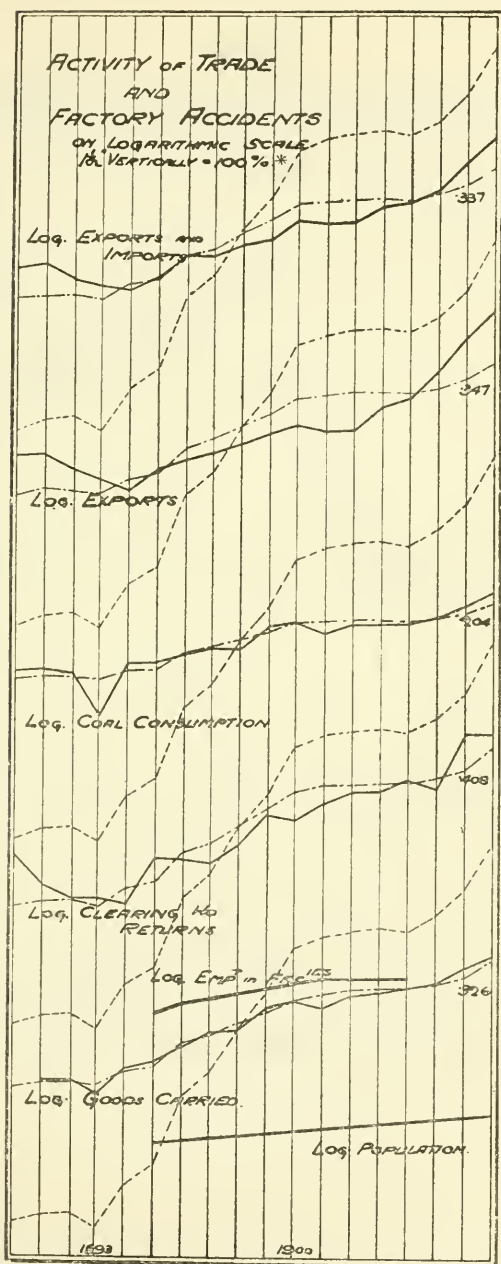


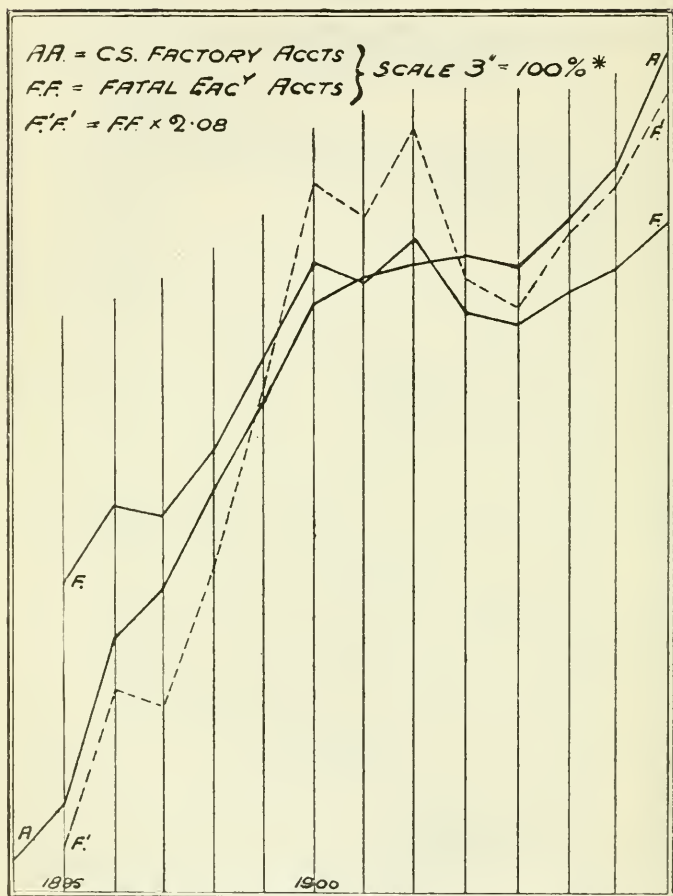
FIG. 2.



* N.B.—In reproduction the diagram has been reduced in the proportion of 1 to 0·57.

The dotted lines are the accident logarithmic curve; the chain lines the same adjusted to the trade curves.

FIG. 3.



* N.B.—In reproduction the diagram has been reduced in the proportion of 1 to 0.67.

FIG. 4.

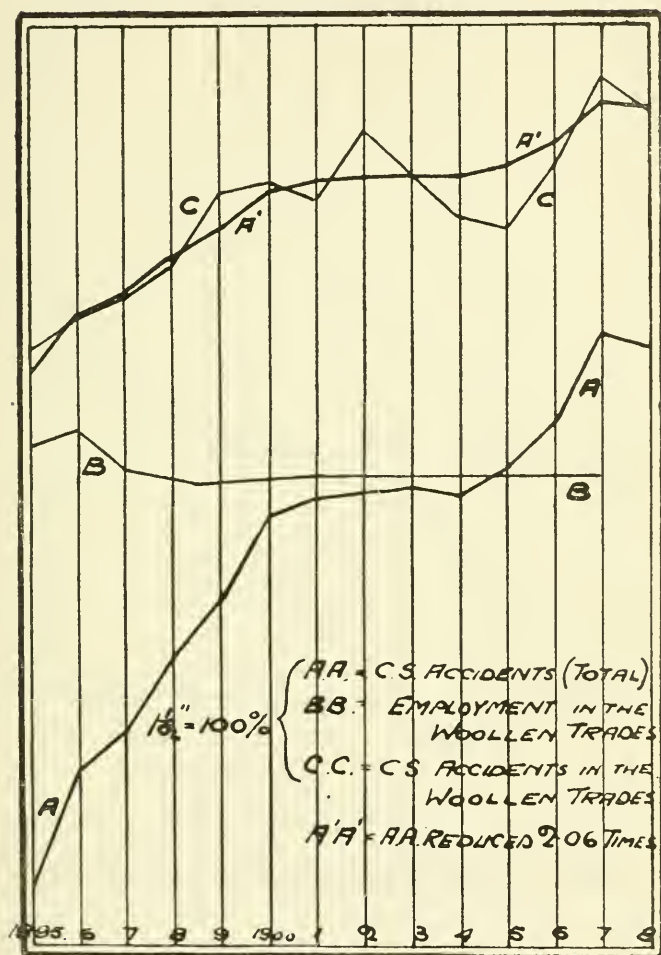
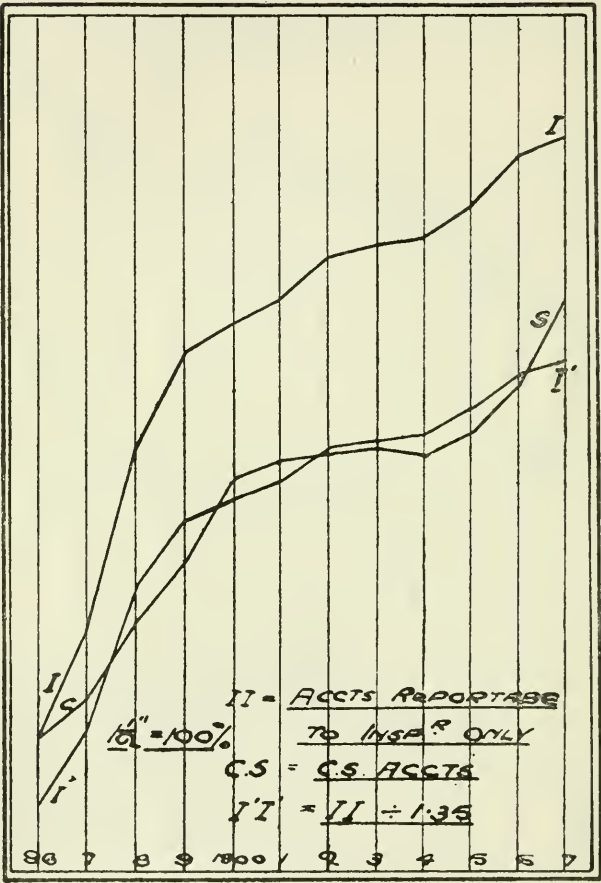


FIG. 5.



DISCUSSION *on* MR. H. VERNEY'S PAPER.

THE CHAIRMAN said both the Society and the author might be congratulated on an interesting and valuable Paper. It was one of the special objects of the Society to warn both the public and the Press against the use of crude figures without scientific, full, and careful examination; and that was the main lesson taught by the Paper. In Table I, which served as the text for the Paper, it was shown that between 1890 and 1907 the number of the accidents reported in factories and workshops increased from 8,211 to 124,325. Those were of course very startling figures. In fact, it almost surprised him that those figures had not been used politically by some Parliamentary candidates as alleged proof of the reckless greed of the manufacturers and of their neglect of due care for the safety of workmen in factories, and so forth. The Paper showed very clearly how carefully figures should be used. The changes made in the definition of "accident" by the Acts of 1891, 1905, and 1906; the increase of the inspectorate, which had been more than doubled during that period, with constant prosecutions for the non-reporting of accidents; the additional incentive to report created by the Workmen's Compensation Act; and the increased number of the population exposed to risk through the increased use of machinery—all those disturbing factors clearly showed that the crude figures in the table referred to could not be accepted as any proof of a real increase of accidents. He regretted that the author had not stated rather more definitely at the end of the Paper the conclusions at which he had arrived as the result of his ingenious calculations; and whether he considered that the figures dealt with really showed any increase. He should also have been glad if he had more definitely dealt with the number of fatal accidents, about which the returns throughout the whole period were in his opinion fairly complete.

Dr. T. M. LEGGE said he could only express his admiration and that of his colleagues for Mr. Verney's Paper. Although accidents naturally interested him as a Medical Inspector of Factories, it was rather the cases of poisoning which occupied him, and it was interesting to compare the returns of poisoning from year to year with those of accidents; for, instead of showing the steady rise which had been brought out in the latter case, there was a distinct and steady diminution in the cases of poisoning. He hoped that Mr. Verney would some day apply his statistical methods to those returns. One very interesting point about them was that the Workmen's Compensation Act, which was referred to as having led to an increase in the number of accidents, did not appear to him to have affected cases of poisoning at all, although it might, and was expected to have done so. Personally, he was doubtful whether that Act had played the large share in the increase to which Mr. Verney had alluded. Mr. Verney's method of eliminating the disturbing elements in

comparison of factory accidents was, he thought, quite admirable. He had thought those disturbing elements so marked as to have made it impossible to get the clear, steady line shown in curve D. He hoped the Paper would come prominently to the notice of the Accidents Committee, which was sitting at the present time. One point, which was perhaps the most important of all, called for further investigation. It was desirable to discover, if possible, how many accidents were due to neglect on the part of the employer, and how many to carelessness—possibly unavoidable, and depending on fatigue, or other causes—on the part of the worker. He believed an attempt had been made at a statistical estimate of that matter by the German Accident Insurance Office. His recollection was that 55 per cent. of the accidents were assigned in that way to causes remediable by the employer, while 45 per cent. were considered to be attributable to other causes, and largely to neglect on the part of the workers.

Dr. GREENWOOD said the only point that occurred to him was with reference to the isolation of the different factors. He asked whether Mr. Verney had considered the possibility of estimating the participation of the different factors by the method of multiple correlation which Mr. Udny Yule¹ had so admirably illustrated and had rendered more manageable than it had been in the original form developed by Professor Pearson. It would have been of considerable help if they had the three or four factors involved, all of which might be independent variables, and all influencing the accident curve, expressed as partial co-efficients of correlation; so as to be able, to a certain extent, to predict the future changes. And then, supposing the actual results not to correspond with the prediction, it would suggest that there might be some other factor not at present obvious in the statistical records available. He could not offer any remarks on the data contained in the Paper, as he was not familiar with them.

Mr. ALFRED FOOT said he felt that the very large increase in the number of reported accidents in factories had been due largely to the Workmen's Compensation Act. The author of the Paper seemed hardly to have given sufficient weight to the effect of that Act upon the notification of accidents. In 1895 only 10,000 accidents were reported; in 1896 there were 33,000. He considered that increase to be largely due to the alteration in the Regulations. In 1897 there was an increase of only 7,000; but in 1898 there was a sudden jump of 17,000. Was not that sudden jump due, to some extent, to the coming into operation of the first Workmen's Compensation Act, which was not, however, fully known to the workers until a year or two later, when there were again jumps from 57,000 to 79,000, and from 79,000 to 83,000? He observed that in 1906 the reported accidents were close on 112,000; in 1907 they rose to 124,000; and during half of the latter year the second Workmen's Compensation Act was in force. That, he

¹ *Proc. Roy. Soc., A.* 1907, lxxix, 182.

thought, would probably account for part of the increase; but it would be interesting to know what was the increase in 1908, when the new Act had been in operation for a complete year. It would be an interesting point if, before the publication of the Paper, the author was able to add the figure for 1908. Personally, he had found that many more things were considered reportable than ever could have been imagined before. Bronchitis was now very often attributed to some minor mishap, and deaths from pneumonia in consumptive patients were often traced to some very slight strain. In some cases of that sort compensation had been awarded, although the connection between the disease and the injury could hardly have been complete.

Dr. LEGGE asked if Mr. Verney could get the total number of accidents in 1908?

Mr. VERNEY said he had not the Returns with him.

Dr. GREENWOOD said there was an actual decrease in all classes of accidents reported to the Inspectors.

Dr. E. L. COLLIS said it would be interesting, in connection with the point just raised, if one could know from the insurance companies whether, with that decrease in accidents, there had been any decrease in the payments, or the reverse, due to the coming into operation of the Act of 1906. It would also be desirable to know how far the increase in payments made by insurance companies for accidents had been in direct proportion to the number of accidents notified in the figures given, in order to see whether there was an ascending curve exactly comparable to the amount of money paid and the increase of accidents notified. If there were no such actual connection, then the claim that the Workmen's Compensation Act, from the monetary side, was leading to an increase of accidents would not hold good.

Mr. E. E. B. ELDRIDGE said, with reference to the fact that fewer accidents were reported in 1908, it would be seen that in the returns secured by the Home Office, under Section 12 of the Workmen's Compensation Act, the number brought forward from 1907 as outstanding at the beginning of the year 1908 was more than the number carried forward to 1909 as outstanding at the end of 1908. That would appear to show that the "rate of accident" towards the end of 1908 was either decreasing, or else that the number of workers "at risk" was very much reduced; otherwise they would naturally expect to find more accidents outstanding at the end of 1908 than at the end of 1907. Having regard to the fact that the former was not likely to be the case, he thought it was clearly proved that the Workmen's Compensation Act of 1906 had not resulted, to any marked extent, in better reporting on the part of employers, as had been suggested. Referring to the compensation returns, it would be seen that in some instances there was a great

difference between the number of accidents which those returns had brought to light and the number reported under the Factory and Workshop Act, to which the Paper referred. The Home Office were endeavouring to get the compensation returns more accurately taken out, and no doubt, in the future, much useful information would be obtained by means of a comparison between those two sets of returns. With regard to one remark on p. 102, it seemed to be suggested that part of the increase in accidents was due to taking on unskilled labour when it was difficult to secure full complements of workmen. While that might be so to a slight extent, he did not think it always increased the risk of accident, because a person newly taken on was as a rule more careful in the use of the machinery. They all knew that familiarity bred contempt, and his experience was that it was rather when operatives came to deal with a machine quite mechanically that accidents happened than at the commencement of employment, when more care was exercised.

Mr. YULE said that he, like Dr. Greenwood, could only speak from the standpoint of method, as he was quite unfamiliar with the data dealt with by Mr. Verney. Like Dr. Greenwood, he would investigate the problem of separating the different causes that had affected the rate of increase in the number of accidents by the method of correlation. That method presented certain complexities; but the fundamental idea was quite simple. Presuming that one had sorted out so far as possible the new classes of accidents introduced by special Acts, one determined an equation more or less like this, following as nearly as possible the way that Mr. Verney had looked at the problem:—Annual percentage increase in accidents = a constant $a + b$ (annual percentage increase in trade) + c (annual percentage increase in inspectorate) + other terms if necessary. The constants of this equation were determined, not by a method of estimation, but by a direct arithmetical method which gave what were in a certain sense the best possible values of (b) and (c), &c. Such an equation would exhibit the dependence of the increase of accidents on the increase in trade, the increase in the number of inspectors, or any other factors the investigator might like to take into account, although it would be rather difficult as a matter of arithmetic to take into account more than three. As a definite answer was thus obtained which was not dependent upon the personal equation of the investigator, the first question that occurred to him was as to how Mr. Verney determined his ratio of the slopes of the different curves, *e.g.*, the ratio 2.08 in Fig. 3. Was that an estimate made by eye, or based on the first and last points of the curves?

Mr. VERNEY said it was determined by the amount of the reduction of the ordinates, by comparison of the areas.

Mr. YULE said he was glad to know that; as nothing was said on the point he was afraid the ratio merely estimated. The method

actually used by Mr. Verney struck him as extremely ingenious, and the way in which the answers came out was very pleasing. He had found exactly half the increase due to one factor, and half due to another, and it was rather surprising that the result was so good—in fact, its exactness almost made one sceptical; but it was difficult to see anything wrong about it. The author was lucky in finding, in the woollen and worsted trade, the index that he required to the state of affairs in stationary trades; but one wanted to know if that trade was typical of what occurred in other non-expanding trades. If not, the answers ought not to have fitted in the way they did. There was another point which puzzled him. There was a statement on p. 101 that accidents increased three times as fast as the volume of manufactures. He could conceive that statement as holding true for the percentage changes from year to year or for short-period changes, but, if he rightly understood the result, the statement referred to a long-period increase. It seemed to him that accidents should not and could not continually increase three times as fast as the volume of manufactures. They should not do so because over a long period a normal increase in manufactures might be expected; if the population increased at a certain percentage rate the volume of manufactures ought to increase in about the same ratio. At that rate of increase no incompetent people would be suddenly dragged in to manufacture things they knew nothing about, and the rate of increase of accidents should be the same as, and not greater than, the rate of increase of manufactures.

Mr. VERNEY said the cotton trade expanded very considerably a few years ago.

Mr. YULE said that was a short-period change owing to the fluctuations of trade, but over a long period it seemed natural to suppose that in this country the total volume of manufactures would only increase *pari passu* with the increase of population. It was only during a sudden boom that one would get the entry of incompetent persons; when the trade fell off again one would only have experienced workmen, and one would have the normal or rather minimum number of accidents. He would accordingly expect that accidents would only increase three times as fast as the manufactures during the short-period fluctuations of trade. The rule could not, it seemed to him, hold true over any very long period, for if it did the number of accidents would ultimately become greater than the number of persons employed. The Paper was extremely interesting as illustrating the use of the graphic method, which had been very effectually applied.

Mr. VERNEY in reply said the points raised by Mr. Yule were important, and he would deal with them while they were fresh in his memory. There could be no doubt that the fluctuations in the number of accidents corresponded with the fluctuations of trade; a comparison of the accidents curve with the goods traffic curve seemed to settle that. Mr. Yule suggested that the increase in

accidents due to certain causes, such as better reporting, could not go on for ever. That was so, and a diagram he had prepared, which had not been reproduced, seemed to show that the increase due to better reporting fell off at the rate of about 2 per cent. per annum, so that in three or four years it would be very little. Alterations in the statutory definition of an accident had been numerous, and each had been followed by a similar period of defective reporting. As to that part of increase in accidents which he attributed to expanding trade, that also might be getting less. He had simply taken an average over the past 15 or 20 years, and he could not say how long it would hold good. Mr. Yule had also suggested that the percentage increase in accidents might be computed by the aid of an expression of the shape $a + b$ (percentage increase of trade) $+ c$ (percentage increase of inspectors) $+ d$ (. . .) and so on. That, no doubt, would have been the proper way of approaching the subject in a Paper read before that Society, but he would not venture to use such a formula to predict anything, and he fancied that the diagrammatic method, which exhibited at a glance the relation between two or more curves representing fluctuating quantities, was more generally understood. The Chairman had asked whether accidents had really increased. He thought they had, and that the increase corresponded very closely with the increase in trade. Dr. Legge had called their attention to the amount of clerical work which had now to be done by the inspectors of factories, to the detriment of inspection proper, but notwithstanding that he thought factories were now better inspected than ever. The number of inspectors had been increased, they worked harder, and much of the work was in a sense cumulative. For example, if a dangerous machine was once fenced off properly and the work was done well, the effect lasted; and to that extent the inspectors' attention could be transferred to other things. Dr. Legge's second point was with regard to the diminution in the number of cases of poisoning which he (Dr. Legge) had found to have taken place. As to that, he thought the Compensation Act, with which he was not very familiar, had not been applicable to poisoning cases so long as to accidents. There might also be less encouragement for a person alleged to have been poisoned to claim in a doubtful case on the ground that the case was more likely to be dealt with by an impartial referee. It had been asked what proportion of accidents was due to negligence. He believed a very considerable proportion. He had with him some figures for a portion of the Lancashire manufacturing area from which it appeared that out of 261 cotton mill accidents which were due to negligence on the part of somebody, not less than 191 were due to the negligence of the injured person himself, and in 22 of these cases the negligence could only be described as gross. Dr. Greenwood had referred to the method of multiple correlation, but he thought that was covered by his reply to Mr. Yule. He had exhibited the relation between his quantities graphically, a method which he thought was sufficiently accurate for the purpose, and one which the most unskilled person could understand. The "man in the street," so to speak, could easily compare two curves and see

what relation and what degree of similarity existed between them. Mr. Foot had called attention to the effect of the Workmen's Compensation Act and undoubtedly that had been very great, and, indeed, quite obscured the good work which was being done by the inspectors. Mr. Foot had asked for the figures for 1908. The returns for that year were not published when the Paper was written, but he would see if it were possible to include them before publication. He thought the accidents he had been dealing with had not been affected by the latest Compensation Act because they were included in the original Act of 1897. Dr. Collis had suggested that if the curve representing the increase in accidents were compared with another representing the payments made by insurance companies useful information might be derived. He did not know where such figures could be obtained, but there seemed to be an objection to their use because in slight cases an employer often paid when he could not have been compelled to do so; if, however, in such a case he fought, he would not be likely to recover his costs.

Mr. FOOT said accident insurance companies were bound to make returns of the amount paid by way of compensation for accidents.

Mr. VERNEY said it was a point he might well have gone into, and he thanked Dr. Collis for the suggestion. With regard to the 1908 figures, he might recall that trade fell off considerably in 1907 and the slump continued during 1908, at any rate, in the North; and accidents followed trade. Mr. Eldridge had suggested that new hands were more careful, and therefore less liable to accidental injury. His own experience, however, was to the contrary. The new hands did not appreciate the danger of certain parts of machinery until they had put their fingers in and got them damaged, and not always even then. He remembered having a lesson of that kind himself, but it had not happened again. The older hands might get careless, but in that case they instinctively avoided the dangerous parts.

The following candidates were elected Fellows of the Society:—

Edgar Crammond.
Henry Joseph Jack.

| Frederick John Marriner.
James Watt.

OBITUARY.

Nicolaas Gerard Pierson.

LE 24 Décembre 1909 l'éminent économiste et homme d'état hollandais N. G. Pierson mourut à Heemstede dans la 71^e année de sa vie.

Quoique le temps pour écrire une biographie ne soit pas encore venu—sa vie était sous divers points de vue tellement fructueuse qu'il faut d'abord collectionner les matériaux pour un tel travail qui donnera compte de l'influence si remarquable que Pierson a exercé, grâce aussi à son caractère absolument intègre et noble, sur la vie intellectuelle et politique dans les Pays-Bas—un bref aperçu de sa vie et de ses œuvres pourra déjà faire sentir la gravité de la perte de cet éminent homme.

Né le 7 Février 1839, Pierson débuta dans le commerce pour lequel il s'était préparé par un voyage aux États-Unis et aux Antilles. Rentré dans son pays il fondait d'abord à Amsterdam une maison de commerce, mais en 1865 il fut nommé directeur de la Banque d'émission pour les Indes Occidentales qui venait d'être fondée.

Économiste de vocation, il publiait, pas plus tard qu'en 1859, une étude sur la situation des banques aux États-Unis, qui était pour un jeune homme de 20 ans tout à fait excellente. Il faisait suivre un petit livre sur la question de la réorganisation de la Banque Néerlandaise, qui était très discutée en 1863, et plusieurs articles dans les revues néerlandaises (e.a. sur le système de Ricardo, la méthode à suivre dans les études économiques, sur la théorie de la production, et sur l'histoire des doctrines économiques en Italie) qui attiraient sur lui l'attention du Dr. W. C. Mees, économiste distingué qui occupait la Présidence de la Banque Néerlandaise.¹ Sur sa proposition Pierson fut nommé, à l'âge de 29 ans, co-directeur de la seule banque d'émission dans les Pays-Bas. Dans ce temps il publiait e.a. un beau livre sur la politique coloniale de la Hollande, ainsi qu'en deux volumes, ses Principes d'économie politique.

Lorsqu'en 1877 l'Université d'Amsterdam fut créée, Pierson était le premier qui fut appelé à la chair d'économie politique, qu'il occupa jusqu'en 1885, quand il succéda feu M. Mees à la Présidence de la Banque Néerlandaise. Entre 1877 et 1885 il fit paraître e.a. deux études sur le socialisme d'état, une étude sur la crise de 1873 et un article sur la physiocratie. En même temps il préparait son Manuel d'économie politique dont le premier volume parut en 1884 et le second en 1890.

C'est à lui comme Président de la Banque Néerlandaise qu'on est redevable de la participation de l'État aux bénéfices de la banque, et de la politique monétaire ayant pour but la fixité des changes sur

¹ Voir sur Mees, L. Cossa, *Histoire des doctrines économiques*, p. 437, suiv.

l'étranger qui a été dès lors suivi sans interruption, et qui a largement contribué au développement du crédit national et du commerce dans les Pays-Bas.

Il resta Président de la Banque jusqu'en 1891, lorsque la portefeuille des Finances dans le Ministère Van Tienhoven lui fut confiée. Dans cette qualité il a réorganisé radicalement les finances des Pays-Bas en supprimant le droit de patente qu'il remplaçait par l'impôt sur les revenus professionnels, lequel avec l'impôt sur les fortunes introduit par lui, constitue l'impôt sur tous les revenus dans la Hollande. De plus, il abolit l'accise sur les savons, et diminua celui sur le sel, les droits de mutation et les droits d'hypothèque, en augmentant par contre l'accise sur l'alcool.

Après l'échec du Ministère en 1894 il reprit ses études économiques, et publia la deuxième édition de son Manuel; une étude très approfondie et documentée sur la question de l'or (traduite en Allemand dans le "*Zeitschrift für Volkswirtschaft*" de M. von Inama-Sternegg) et une étude pas moins excellente sur la situation économique de l'île de Sicile.

En 1897 il fut appelé une fois de plus au Ministère des Finances dans le Cabinet dont la formation lui avait été confiée. Les principales lois auxquelles il prêta son concours furent la loi sur l'assurance obligatoire contre les accidents de travail, et la loi pour l'amélioration des habitations populaires.

En 1901 il dut quitter le gouvernement après les élections générales qui donnaient la majorité aux parties cléricales. Se vouant de nouveau aux études économiques il faisait paraître des articles sur la question de l'habitation du peuple; sur la théorie du socialisme, sur l'histoire de la monnaie dans les Pays-Bas, etc. En 1905 il fut nommé membre de la seconde Chambre des États Généraux, où il resta jusqu'en 1909.

Notons avant de quitter sa vie politique que la création de la Commission Centrale de Statistique et du Bureau Central de Statistique des Pays-Bas est due à son initiative.

Le "Manuel" a été traduit en Anglais et en Italien (voir Cossa l.c. p. 439).

Lors de son soixante-dixième anniversaire ses administrateurs et amis ont créé la Fondation-Pierson, destinée à donner, tous les cinq ans, une médaille-Pierson à l'auteur du meilleur ouvrage économique qui ait paru dans ce temps.

Ajoutons que Pierson était membre de l'Académie Royale des Sciences à Amsterdam, associé de l'Accademia dei Lincei à Rome, docteur honoris causa en droit à l'Université de Leyde et membre honoraire du Royal Statistical Society de Londres depuis 1896.

C. A. VERRIJN STUART.

MISCELLANEA.

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I.—*The Statistics of Wages in the United Kingdom during the Nineteenth Century. (Part XV.) The Cotton Industry. Section II.* By GEORGE HENRY WOOD, F.S.S.

Mule spinning.

Probably the part of the cotton trade which has been most completely altered in character and structure during the nineteenth century is mule spinning. The difficulties in tabulation arise from the great range of earnings possible at any date, according to whether the counts spun are coarse, medium, or fine ; the mules long (that is, containing a large number of spindles), or short ; and, until recent years, whether the work was done on hand mules or self-acting mules. In the following tabulation (the figures being rarely stated definitely for any of the different classes of spinners) the statements are placed where they seem to fit best, but the classification is quite arbitrary.

TABLE 5.—MANCHESTER AND DISTRICT. *Average earnings in mule spinning for an ordinary week's work, 1804-1906.*

Year.	Hand mule spinners.			Self-actor minders.			Spinners' average.	Piceers.				Piceers' average.	Authority.
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.		Big.	Middle.	Little.	Scavengers.		
1804.....	s. 32/6, 36/6		s. —	s. —		s. —	s. —	s. —	s. —	s. —	s. —	s. 27/6, 31	4 a*
'10.....	42/6	—	20, 28	—	—	—	—	—	—	—	—	—	3
'11.....	18†	—	20, 28	—	—	—	—	—	—	—	—	—	3
'12.....	30†	—	20, 28	—	—	—	—	—	—	—	—	—	3
'13.....	27†	—	20, 28	—	—	—	—	—	—	—	—	—	3
'14-22.....	32	—	20, 28	—	—	—	—	—	—	—	—	—	3
'14.....	44/6, 60	—	—	—	—	—	—	9/6, 10/6	—	—	—	s. 27/6, 30	4 a*
'18-24.....	35	25	—	—	—	—	—	—	—	—	—	—	42
'23-25.....	—	—	20, 28	—	—	—	—	—	—	—	—	—	3
'23.....	—	—	—	—	—	—	26/7	—	—	—	—	—	23
'24.....	—	—	—	—	—	—	24/2	—	—	—	—	—	23
'25.....	—	—	—	—	—	—	29/8	—	—	—	—	—	23
'26.....	—	—	—	20, 27	—	12, 18	—	—	—	—	—	—	43
'27.....	—	—	—	—	—	—	26	—	—	—	—	—	23
'28.....	—	—	—	—	—	—	27/4	—	—	—	—	—	23
'29.....	—	—	—	—	—	—	28/11	—	—	—	—	—	23
'30.....	—	—	—	—	—	—	28/6	—	—	—	—	—	23
'31.....	—	—	—	—	—	—	30/2	—	—	—	—	—	23
'32.....	—	—	—	—	—	—	27	—	—	—	—	—	23
'32.....	—	—	—	—	—	—	29/10	—	—	—	—	—	23
'32.....	—	—	—	—	—	—	20, 25	—	—	—	1/6, 2/8	s. 4/7, 7	3

* Very fine numbers. The piceers' wages are gross, and the number per spinner is not stated.

† Short time.

TABLE 5—*Contd.* MANCHESTER AND DISTRICT. *Average earnings in mule spinning.*

Year.	Hand mule spinners.			Self-actor minders.			Spinners' average.	Piecers.				Piecers' average.	Authority.
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.		Big.	Middle.	Little.	Scavengers.		
1833.....	s. 33/1	s. —	s. —	s. —	s. —	s. 16 4	s. 28/4	s. —	s. —	s. —	s. —	s. 5/7	3*
'33.....	33/3	—	—	—	—	—	—	8/6, 9/6	—	—	—	—	4
'33.....	33/8, 42/9	—	—	—	—	—	—	—	—	—	—	21, 22/6	4 a†
'33.....	30 to 40	—	—	—	—	—	27	—	—	—	—	—	4
'33.....	25, 35			18, 21			—	—	—	—	3, 4/6	4, 8	22
'33.....							27/2	—	—	—	2/9	5/10½	4 and 40†
'33.....	—	—	—	—	—	—	25/8	—	—	—	2/11	5/5	4 and 40§
'36.....	—	—	—	—	—	—	26	10/6	—	—	4/2	—	26 a
'36.....	—	—	—	—	—	—	30/8	9	—	—	4/6	—	26 b
'36.....	—	—	—	—	—	—	21	8	—	5	3/2, 4/6	—	26 c
'36.....	35, 40	—	—	—	—	—	30	9	—	6	—	—	26 d
'36.....	—	—	—	—	—	—	—	—	—	—	—	—	26 f
'36.....	—	—	—	—	—	—	—	—	—	—	—	29/6	26 g||
'38.....	44/2	—	—	—	—	—	—	—	—	—	—	—	3 and 34
'39.....	40, 42, 45	25	23	—	18	16	—	8	—	—	—	—	15
'40.....	—	25, 27	—	—	13, 19	—	—	10	—	6	2/6, 5/2	—	15
'41.....	—	24, 27	—	—	13, 20	—	—	10	—	6	2/6, 5/4	—	26 a
'41.....	—	—	—	—	—	—	16	7/6	—	—	—	—	26 b
'41.....	—	—	—	—	—	—	18, 18/6	9	—	—	—	—	26 c
'41.....	—	—	—	—	—	—	21	8	—	5	—	—	—

* The figures are part of the census taken by the Children's Employment Commission. The details are, 1,479 spinners averaged 28s. 4d., and 2,944 piecers 5s. 7d. Two firms' averages were, A.B. 42 spinners, 16s. 4d., and C.D. 33 spinners, 33s. 1d.

† Very fine numbers. The piecers' wages are gross, and the number per spinner is not stated.

‡ Manchester. § South Lancs. || Piecers' gross earnings, number not stated.

TABLE 5—Contd. MANCHESTER AND DISTRICT. *Average earnings in mule spinning.*

Year.	Hand mule spinners.			Self-actor minders.			Spinners' average.	Piecers.				Authority.	
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.		Big.	Middle.	Little.	Scavengers.		Piecers' average.
1841.....	s.		s.	s.		s.	s.	s.		s.	s.	s.	26 <i>d</i>
'41.....	35, 40	—	—	—	—	—	24	9	—	6	—	—	26 <i>f</i>
'41.....	—	—	—	—	—	—	25, 2	—	—	—	—	21/6	26 <i>g</i> *
'42.....	—	22/6, 27	—	—	—	—	—	10	—	6	2/6, 5/2	—	15
'43.....	—	20/9, 29	—	—	13, 16	—	—	10	—	6	3, 5/2	—	15
'44.....	—	22, 30/6	—	—	13, 16	—	—	10	—	7	3, 5/8	—	15
'44.....	—	—	—	25, 30	—	12, 20	—	—	—	—	—	—	43
'44.....	—	—	—	—	—	14	—	—	—	—	—	7	3 <i>c</i>
'45.....	—	23/6, 32/7	—	—	16/2, 20/2	—	—	10/9	—	7/6	3/6, 5/6	—	15
'46.....	50 to 60	—	—	—	17, 19	—	—	—	—	—	—	—	15
'48.....	36 to 40	21	21	—	18/6	18	19/3	8, 6, 9	—	—	—	8/1	28
'49.....	—	—	—	—	—	15/6	—	—	—	—	—	7/9	3 and 34
'49.....	38	—	—	—	—	16	—	11	6/6	5/8	—	—	3 <i>c</i>
'50.....	—	—	—	—	—	18	—	—	—	—	—	—	10 <i>d</i>
'50.....	—	—	—	—	—	—	—	—	—	—	—	—	10 <i>a</i>
'50.....	40	—	—	—	—	—	—	—	—	—	—	—	10 <i>b</i>
'50.....	—	—	—	—	—	—	—	13	—	—	—	—	10 <i>c</i>
'50.....	—	—	—	—	—	—	20	—	—	—	—	—	30 <i>a</i>
'53.....	—	—	—	—	—	—	22	—	—	—	—	—	30 <i>a</i>
'54.....	—	—	—	—	—	—	20	—	—	—	—	—	30 <i>a</i>
'59.....	30, 40, 42, 45	23	23	—	22	20	—	9, 10	—	—	—	—	3 and 34
'60.....	—	—	—	—	—	—	22, 27	—	—	—	—	—	30 <i>a</i>
'60.....	38	—	—	—	—	—	—	11	6/6	5/8	—	—	10 <i>d</i>

* Piecers' gross earnings, number not stated.

TABLE 5.—*Contd.* MANCHESTER AND DISTRICT. *Average earnings in mule spinning.*

Year.	Hand mule spinners.			Self-actor minders.			Spinners' average.	Piecers.				Piecers' average.	Authority.
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.		Big.	Middle.	Little.	Scavengers.		
1860.....	s.	—	s.	s.	—	s.	s.	s.	—	s.	—	s.	10 a
'60.....	—	—	18	—	—	18	—	—	—	—	—	—	10 b
'65.....	—	—	18	—	—	—	30	—	—	—	—	—	30 a
'70.....	36	—	—	—	—	—	—	15	11	6	—	—	10 d
'70.....	—	—	20, 22	—	—	—	—	—	—	—	—	—	10 a
'70.....	—	—	22	—	—	—	—	—	—	—	—	—	10 b
'71.....	—	—	—	—	—	—	24, 30	10, 16	—	6/6, 7	—	—	35 a
'71.....	45, 50	—	—	—	—	—	—	9, 10	—	6/6	2/6	—	9 a
'72.....	55, 65	—	—	—	—	—	—	10, 14	—	—	—	—	6 a
'72... {	49	—	—	—	—	—	—	15	10, 11	6, 7/6	—	—	6 b
'74.....	42	—	—	36	—	28	—	10, 15	9, 9/6	4, 4/6	3	—	51 c
'74.....	—	—	—	—	—	—	—	15	—	—	—	—	51 d
'74.....	—	—	—	35 8	—	—	—	11	7/6	5	—	—	3
'74.....	42, 45, 47, 50	—	—	—	—	—	—	12, 15	—	8	—	—	35 b
'76.....	—	—	—	—	—	—	28/4	13/6	—	—	—	—	35 a
'76.....	—	—	—	—	—	—	29, 35	11, 16	—	7/6	—	—	50
'77.....	—	—	—	—	—	—	27/6, 32	—	11	6/3	—	—	10 d
'77.....	53	—	—	—	—	—	—	16/6	—	—	—	—	10 a
'77.....	—	—	25, 28	—	—	—	—	—	—	—	—	—	10 b
'77.....	—	—	30	—	—	—	—	—	—	—	—	—	44
'77.....	—	—	—	—	—	—	34	—	—	—	—	—	37
'77.....	—	—	—	—	—	—	32, 40	—	—	—	—	—	3
'77.....	—	—	—	—	—	—	29/8, 36	14, 17	—	—	3/6	—	49
'77.....	40, 45, 50, 55	—	—	—	—	—	—	12/10, 14/6	—	8/6	—	—	3
'78.....	—	—	—	—	—	—	—	17	—	8/6	—	—	49
'80.....	—	—	—	42	—	—	—	12/6	—	8/6	6	—	3
'80.....	—	—	—	—	—	—	28/9	—	—	—	—	—	3

TABLE 5—*Contd.* MANCHESTER AND DISTRICT. *Average earnings in mule spinning.*

Year.	Hand mule spinners.			Self-actor minders.			Spinners' average.	Piecers.			Piecers' average.	Authority.
	Fine.	Medium.	Coarse.	Fine.	Medium.	Coarse.		Big.	Middle.	Little.	Scavengers.	
'1882.....	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	12
'83.....	—	—	—	—	—	—	23, 40	11, 16	—	8, 11	7/6, 8/6	3
'83.....	40	—	—	—	—	—	31	16	—	7	—	10 d
'83.....	—	—	—	—	—	25, 28	—	—	11	—	—	10 a
'83.....	—	—	—	—	—	29	—	—	—	—	—	10 b
'83.....	52	—	—	—	—	—	—	16	—	—	—	10 c
'84.....	—	—	—	34	—	26	—	15/6	—	11	—	52
'86.....	43/8	—	—	37/9	33/11	—	35/9	15/3	—	10/10	7/2, 3/2	1*
'86.....	—	—	—	—	—	—	31/3	14/1	—	9/9	—	1†
'87.....	—	—	—	—	—	—	23, 40	—	—	—	—	12 A
'87.....	—	—	—	—	—	28	—	—	—	—	—	13
'90.....	—	—	—	—	—	30, 33	—	—	—	—	—	10 a
'90.....	—	—	—	—	—	31	—	—	—	—	—	10 b
'91.....	—	—	—	—	—	—	35	—	—	—	—	8†
'93.....	—	—	—	—	—	—	37	—	—	—	—	19
'93.....	—	—	—	—	—	—	36, 42	—	—	—	—	13
1906.....	—	—	—	47/6	—	44/1	46/10	15/9	—	7/10	—	2*
'06.....	—	—	—	46	43	38/10	41/5	17/10	—	12	—	2†
'06.....	—	—	—	—	—	—	40	—	—	—	—	19

* Manchester. In 1886 there were women and girl piecers. The wages in the table are for men and lads and boys. The female big piecers earned 12s. 9d., and the little-piecers 8s. 6d. A few girl piecers on hand mules earned 10s. 1d. The average in the final column includes all these.

† Lancashire and Cheshire.

‡ Piecers' gross earnings, number not stated.

As a general rule throughout Lancashire, and, indeed, the whole trade, spinners of fine counts have earned more than the spinning medium, and coarse counts respectively, but this is by no means universally true. Under the Oldham list before its revision in 1907, on a pair of mules of any particular length, the coarser the counts the higher tended to be the earnings, but the finer counts being generally spun in the modern mills, where mules are longer, this variation is obscured in a census. Under other lists the finer the count the greater the earnings on the same pair of mules. Again, wages on hand mules have usually been greater than those on self-acting mules, though at all times the best paid self-actor minder will have earned more than the lowest paid hand-mule spinner.

The change from hand-mule spinning to self-actor minding has taken place gradually, and commenced about 1836. In the districts using American cotton—Manchester (partly), Oldham, Preston, Ashton, &c.—the change was completed many years ago, hand mules being the exception and not the rule in the sixties and seventies. In the Egyptian cotton-using districts, Bolton, Stockport, and Manchester (partly), the change came later. Roughly speaking, the change was made first on coarse counts and gradually extended up through the various degrees of fineness. In Oldham, a fashion for self-acting set in in 1866-70; in Bolton there were very large numbers of mules self-acted some ten or fifteen years later. In all centres, large numbers of self-actors had been erected long before. Taking pairs of mules which were “converted” from hand mules to self-actors in the middle of the century, the consequent effect on earnings would be somewhat as indicated in the following case :—

	Hand Mules.		Self Actors.
	s.		s.
Spinner or minder.....	35		30
Cypher	15 } big		
Middle piecer.....	10 } piecer		12
Little piecer	5 or 6		7
Gross earnings	65 or 66		49

In recent years the earnings of spinners have tended to be much more uniform than formerly. In 1906, the lower quartiles of coarse spinners in Lancashire and Cheshire is 33s. 6d., and the upper quartiles of fine spinners is 50s. 6d., so that a range of from 30s. to 55s. is still possible, and either of these figures might be the average wage of all the spinners employed in a particular mill. Seventy years ago the range was greater, and anything from 15s. to 50s. might easily be the variations in the average from mill to mill. Piecers would vary less, but there might be one, two, or three piecers per spinner, and while the little piecers (lads) would not vary greatly, the big piecers might vary 5s. or more.

Perhaps the following general view is a fair approximation to the actual variations in spinners' earnings—sufficiently near at least to allow for the known movements and to point the rising and

falling periods. The estimate is intended to apply to the whole of the Lancashire and Cheshire area, but is more particularly applicable to Manchester and its more immediate neighbourhood until the seventies. Since that date the Manchester figures are of comparatively slight importance, and more detailed data are forthcoming from Bolton, Oldham, Preston and Blackburn :—

TABLE 6.—*Approximate estimates of spinners average wages (allowing for numbers employed in the various classes), 1806-1906.*

Class.	1806.	1810.	1814-22	1823.	1824.	1825.	1827.	1828.
	s.	s.	s.	s.	s.	s.	s.	s.
1	Same	42/6	32	—	—	—	—	—
2	as	33	28	—	—	—	—	—
3	1833	24	24	—	—	—	—	—
Average...	—	30/1	26	23	21	25/8	22/6	24

Class.	1829.	1830.	1831.	1832.	1833.	1836.	1839.	1841.
	s.	s.	s.	s.	s.	s.	s.	s.
1	—	—	—	—	33/3	40	42	40
2	—	—	—	—	28	26	18, 25	18, 25
3	—	—	—	—	22	16, 21	16, 23	16, 6
Average...	25/3	24/9	26/2	24/6	25/10	24/4	23/4	21/8

Class.	1845-46	1849-50.	1853.	1854.	1859-61	1866-70.	1872.	1874.
	s.	s.	s.	s.	s.	s.	s.	s.
1	42	37	—	—	39/6	40	40	42
2	23/6	18/6, 21	—	—	22/6	30	34	35/6
3	18	18, 21	—	—	21/6	24	28	29
Average...	23/5	21/10	24	22	24/4	28/6	31/9	33/1

Class.	1877.	1880.	1883.	1886.	1891-93.	1900.	1906.	Weights.
	s.	s.	s.	s.	s.	s.	s.	
1	45	36	38/6	36/1	—	—	46	1
2	36	32	34/9	} 30/8	{ —	—	43	3
3	29/8	28/9	31		{ —	—	38/10	4
Average...	34	30/11	33/4	31/1	36	39	41/5	8

Rough though this generalisation is, I do not think it can be far wrong. The summary given later under the Oldham section corresponds very closely, but is based on entirely different data.

Class 1 is intended to apply to fine counts or long mules; Class 2 to medium counts, or mules of medium length; and Class 3 to coarse counts or short mules.

We have less information for piecers, who number approximately 2 to every spinner, and who used in the early days of the industry to more nearly number 3 to 1. The estimate given below is suggested as an approximation requiring to be filled in after study of the other

districts. We have it in our favour than any error in the case of piecers will probably be smaller proportionately than in the case of spinners, as the range of their wages is less. In 1906, for Lancashire and Cheshire, the census shows the following:—

		Average.	Lower Quartile.	Median.	Upper Quartile	Number.
		s.	s.	s.	s.	
Big piecers.....	{ Time	18/4	16/6	18/6	20/6	5,971
Men	{ Piece	20/10	18/6	20	22	120
Big piecers ..	{ Time	16/7	15	16/6	18	2,880
Boys	{ Piece	17/5	15/6	17/6	19	44
Little piecers ..	{ Time	12	10/6	11/6	13/6	8,211
Boys	{ Piece	11/7	9/6	12	13/6	72

9,015
8,283

Lads and boys, big piecers, earn less than men. Generally, where a young big piecer is employed he gets less than a man would on the same pair of mules, and the little piecer gets the difference. There are cases of “joiner” big piecers, where two lads share equally the gross piecing wages according to the list prices, but the census does not show whether these are classed as big or little piecers. Probably the former, bringing down the “lads and boys” (big piecers’) averages.

The range of big piecer’s wages is probably about 6s., and of little piecers probably about 4s. 6d. At no time during the past hundred years will the range have been greater, and in any particular district it is not now, and probably never was, as great as that of the whole of Lancashire and Cheshire taken together. In most districts 3s. is the range between the upper and lower quartiles, and the greater range in the Lancashire and Cheshire figures is brought about by the low wages paid at Bolton and Leigh, where one-half of the big piecers range from 15s. to 16s. The errors involved in the following estimates, therefore, are not necessarily very great. If anything, the statements for the first half-century are too high.

TABLE 7.—*Approximate estimate of piecers’ average wages, 1814-1906.*

	1814.	1833.	1839-43.	1845.	1849.
	s.	s.	s.	s.	s.
Big	10	9	10	10/6	8/9
Middle	—	5/6	6	7	6/6
Little.....	—	3/6	5	5/6	5/6
Average	6/6	6	7	7/8	7

	1859.	1871.	1874-77.	1882.	1886.	1906.
	s.	s.	s.	s.	s.	s.
Big	10	12	14	14	14/2	17/9
Middle	6/6	7	8/6	9	9/3	12
Little.....						
Average ...	8/3	9/6	11/3	11/6	11/9	15

Up to 1886, this estimate allows for half-time piecers; in 1906 we have no information about them. Probably the average for 1906 is too high, perhaps by 3*d.*, but as with all other statements from the 1906 census, we have no means of correcting our figures for the small groups of girls and boys employed, whether full time or half-time, in occupations mainly carried on by young persons and adults.

Winding, reeling, warping, and weaving.

The difficulties in dealing with statements of weavers' earnings are very similar to those relating to spinners. The possible variations are so great and the unknown is frequently of so much importance, that we can never be sure of our results. Weavers may have 2 broad looms, or 2, 3, 4, or even 6 narrow looms, or even broad and narrow looms may occasionally be worked by the same weaver. Four loom weavers may have a "tenter," or may not; the tenter may be a full-timer or half-timer, and the wage stated may be net or gross, out of which the tenter has to be paid. It is quite certain that the number of looms per weaver has increased since the introduction of power loom-weaving, but we have very little means of knowing what that number has been except in 1886 and 1906. In the "thirties" 2 looms were most usual, 3 looms less usual, and 4 looms very unusual, and always with a tenter. We have no record in contemporary writings of one-loom weavers (except on broad looms, weaving sheetings, where the earnings are much higher), yet they are mentioned in the 1886 census, and old weavers and overlookers have informed me that one-loom weavers were not at all unusual until after 1860. Two important inventions made possible a really tangible increase in the number of looms for weavers, namely, the weft fork and the automatic temple. The weft fork, adding to the automatic qualities of the loom, made a greater speed possible, and the automatic temple, whereby the cloth as woven was automatically kept stretched instead of the loom having to be stopped after every few inches were woven to alter the stick which was stretched across to keep the woven cloth tight, made the minding of one more loom per weaver immediately possible.

In 1886 the average number of looms per weaver (omitting broad looms and fustian looms) was 3·3; in 1906, 3·44 (omitting men two-loom weavers, who were mainly broad-loom weavers) was the average. In Manchester, in 1886, there were 2·48 looms per weaver, and in 1906, 2·93, or half a loom per weaver less than the average for Lancashire and Cheshire. Manchester has thus in weaving, as well as in the other branches of the trade, long ceased to be typical. Most of our statements for years later than 1850 refer to, or are intended to embrace, the whole Lancashire and Cheshire area, and we must therefore ignore the Manchester loom average per weaver, and take that typical of the wider area. Summing up all the evidence obtainable, including individual statements from employers in various parts of Lancashire, the following seems the most probable average number of looms per weaver. From the introduction of the power loom, 2, rising to about 1850, $2\frac{1}{5}$, increasing

slowly to 1860 to $2\frac{2}{5}$, after the cotton famine a more rapid increase to $2\frac{4}{5}$ by 1870, and slower increase to $3\frac{1}{5}$ by 1877. By 1886 the average had advanced to 3·3, and 1906, 3·44. The advance has, therefore, been very slow since the middle "seventies."

The details relating to the other occupations speak for themselves. They are fairly consistent for winding, reeling, and warping, but much less consistent for beaming, drawing-in, twisting-in, dressing, and sizing. Overlookers or tacklers vary considerably, but their wages are much less a matter of individual bargain than those of spinning and carding overlookers. As a rule they are paid at rates varying from 1s. 4d. to 2s. per 1l. on the earnings of the weavers whose work they superintend, and will have from 70 to 90 looms in their charge. If the average number is 80 looms, and we take the average per loom at 6s., this represents about 1s. 8d. per weaver, or 42s. per tackler.

The following table contains the statements relating to this branch of the trade in Manchester and district :—

TABLE 8.—*Average earnings in weaving, &c., for an ordinary week's work. Manchester and district, 1797-1906.*

Year	1797.	1806.	1809.	1810.	1811.	1811.
Authority	46.	4 a.	46.	3.	4 a.	3.
	s.	s.	s.	s.	s.	s.
Winders	4/6*	—	—	—	—	—
Reelers	—	19, 30	12, 14	12	15	6
Warpers, M.	—	—	—	16	—	16
" W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
" helpers ..	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
" 3 " 	—	—	—	—	—	—
" 4 " 	—	—	—	—	—	—
" 6 " 	—	—	—	—	—	—
" average	—	—	—	—	—	—
" per loom	—	—	—	—	—	—
" helpers	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

* Boys and girls.

TABLE 8—Contd. *Average earnings in weaving, &c., Manchester and district.*

Year	1812.	1813.	1814-20.	1815.	1818.	1821-22.
Authority	3.	3.	3.	4a.	4a.	3.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	—	—
Reelers	9 11	8, 2	10	15	15	10
Warpers, M.	16	16	16	—	—	18
„ W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „ ...	—	—	—	—	—	—
„ 4 „ ...	—	—	—	—	—	—
„ 6 „ ...	—	—	—	—	—	—
„ average ...	—	—	—	—	—	—
„ per loom ...	—	—	—	—	—	—
„ helpers ...	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

Year	1823-25.	1824.	1826.	1827.	1832.	1833.
Authority	3.	4a.	43.	41.	3.	4 and 40.*
	s.	s.	s.	s.	s.	s.
Winders	—	—	9, 10/6	8, 10	8, 11	—
Reelers	10	12	—	—	—	—
Warpers, M.	16	—	—	—	—	—
„ W.	—	—	10, 12	10, 12	8, 11	12/3
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	24, 30	—	—	24/6
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „ ...	—	—	—	—	—	—
„ 4 „ ...	—	—	—	—	—	—
„ 6 „ ...	—	—	—	—	—	—
„ average ...	—	—	10, 12	—	13,† 16/10† 8, 12‡	12/6
„ per loom ...	—	—	—	—	—	—
„ helpers ...	—	—	—	—	—	—
Dressers	—	—	25, 30 {	20, 25 { 30, 40 }	28, 30	27
Sizers	—	—	—	—	—	—

* Manchester.

† Men.

‡ Women.

TABLE 8—*Contd. Average earnings in weaving, &c., Manchester and district.*

Year	1833.	1833.	1833.	1834.	1834.	1834.
Authority	4 and 40.*	22.	19.	14 A.	14 B.	14 C.
	s.	s.	s.	s.	s.	s.
Winders	—	—	9/6	—	—	—
Reelers	—	7, 13	—	9	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	10/11	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	26/3	—	—	1839. 25	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average	10/11	10, 16	12/6	1839. 12/6	11	1842. 16
„ per loom	—	—	—	—	—	—
„ helpers ...	—	—	—	—	—	—
Dressers	27/10	—	—	—	—	—
Sizers	—	—	—	—	—	—

Year	1834.	1834.	1834.	1836.	1836.	1836.
Authority	14 D.	14 E.	14 F.	26 a.	26 b.	26 c.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	—	—
Reelers	—	—	7/6	9, 9/6	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	—	—	—	9, 9/6	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average	14/3	11	—	—	9/6, 10/6	10/6
„ per loom	—	—	—	—	—	—
„ helpers ...	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

* Lanes and Cheshire (S. Lanes only in 1833).

TABLE 8—Contd. *Average earnings in weaving, &c., Manchester and district.*

Year	1836.	1839.	1839.	1839-41.	1839.	1840.
Authority	26f.	26f.	14 j.	26g.	3 and 34.	15.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	5/6 G. 9/- W.	—
Reelers	—	—	—	8, 10	8/6, 9	6, 9
Warpers, M.	—	—	17/6	—	22	23/7½
„ W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	18/6	—
„ helpers	—	—	—	—	—	—
Twisters in	—	—	—	—	—	—
Beamers	—	—	—	—	22	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	12/1	11/6	—	—	9, 10	—
„ 3 „ ...	—	—	—	—	—	—
„ 4 „ ...	—	—	—	—	16, 17	—
„ 6 „ ...	—	—	—	—	—	—
„ average ...	—	—	—	—	—	11/1, 14
„ per loom ...	—	—	—	—	—	—
„ helpers ...	—	—	—	—	5	—
Dressers	—	—	—	—	20	—
Sizers	—	—	—	—	23	—

Year	1841.	1841.	1841.	1841.	1841.	1841.
Authority	15.	26 a.	26 b.	26 c.	26 f.	26 h.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	—	—
Reelers	7/5, 9	8, 8/6	—	—	—	—
Warpers, M.	24/2	—	—	—	—	—
„ W.	—	8, 9	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	10	7/6
„ 3 „ ...	—	—	—	—	—	—
„ 4 „ ...	—	—	—	—	—	—
„ 6 „ ...	—	—	—	—	—	—
„ average ...	10/2, 14/2	—	9, 10	9/6	—	—
„ per loom ...	—	—	—	—	—	—
„ helpers ...	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

TABLE 8--Contd. *Average earnings in weaving, &c., Manchester and district.*

Year	1842.	1843.	1844.	1844.	1844.	1845.
Authority	15.	15.	15.	3b.	43.	15.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	10, 12	—
Reelers	7/7, 9	6/8, 9	5/10, 9	—	—	7/6, 9
Warpers, M.	24/3	24/5	24	—	—	24/1
„ W.	—	—	—	—	12, 15	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	24, 30	—
Weavers, 2 looms	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average	9/10, 14/2	9/3, 14/2	9/4, 14/2	10/1	10, 12	11/3, 14/2
„ per loom	—	—	—	—	—	—
„ helpers	—	—	—	4/7	—	—
Dressers	—	—	—	—	30, 40	—
Sizers	—	—	—	—	—	—

Year	1845.	1845.	1845.	1845.	1846.	1846.
Authority	29a.	27a.	27b.	3b.	3b.	15.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	—	—	9, 11
Reelers	—	—	—	—	—	8, 9
Warpers M.	—	—	—	—	—	—
„ W.	—	—	—	—	—	9, 11
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	14/4	16/8	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average	12/8	—	11/8	9/9	8/10	10, 16
„ per loom	—	—	—	—	—	—
„ helpers	5/6	—	—	4/6	4/3	—
Dressers	—	—	—	—	—	40
Sizers	—	—	—	—	—	—

TABLE 8—Contd. *Average earnings in weaving, &c., Manchester and district.*

Year	1847.	1848.	1848.	1848-49.	1849.	1849.
Authority	3 b.	3 b.	28.	29 a.	3 b.	3 and 34.
	s.	s.	s.	s.	s.	s.
Winders	—	—	7/8	—	—	{ 6/- G. 9/6 W. 9, 9/6
Reelers	—	—	8/1	—	—	
Warpers, M.	—	—	—	—	—	
„ W.	—	—	—	—	—	22
Drawers-in	—	—	—	—	—	18/6
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	22
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ..	—	—	—	—	—	9, 10
„ 3 „	—	—	—	—	—	13
„ 4 „	—	—	—	—	—	16
„ 6 „	—	—	—	—	—	—
„ average ...	4/7	9	10	10/6	9/5	—
„ per loom	—	—	—	—	—	—
„ helpers	2	4/8	—	—	4/8	5
Dressers	—	—	—	—	—	20
Sizers	—	—	—	—	—	23

Year	1850.	1850.	1850.	1850.	1850.	1850.
Authority	10 a.	10 b.	10 e.	10 g.	10 h.	10 i.
	s.	s.	s.	s.	s.	s.
Winders	7	8/6	8/3	—	—	—
Reelers	—	—	—	—	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving</i>						
Overlookers	22	21	—	—	—	—
Weavers, 2 looms ..	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average ...	11/2½	8/2	9/6½	10/4	8	9/2½
„ per loom	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

TABLE 8—*Contd. Average earnings in weaving, &c., Manchester and district.*

Year	1850.	1853.	1853.	1853.	1854.	1859.
Authority	30 a.	30 a.	16.	16.	30 a.	3 and 34.
	s.	s.	s.	s.	s.	s.
Winders	—	—	—	9, 12	—	{ 5/6 G. 9 W. 9, 9/6
Reelers	—	—	—	—	—	
Warpers, M.	—	—	24, 25	—	—	
„ W.	—	—	—	11, 12	—	23
Drawers-in	—	—	18, 26	18, 25	—	19
„ helpers	—	—	4/6	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	22
<i>Power loom weaving</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	10, 10/9
„ 3 „ ...	—	—	—	—	—	15, 16
„ 4 „ ...	—	—	17/6	—	—	16 to 20
„ 6 „ ...	—	—	—	—	—	—
„ average ...	10	11	—	10, 16	10	—
„ per loom	—	—	—	—	—	—
„ helpers ..	—	—	4/6	—	—	5
Dressers	—	—	—	25, 30	—	20
Sizers	—	—	—	—	—	25
Year	1860.	1860.	1860.	1860.	1870.	1870.
Authority	10 a.	10 b.	10 c.	30 a.	10 a.	10 b.
	s.	s.	s.	s.	s.	s.
Winders	8	9	10/9	—	11	11/6
Reelers	—	—	—	—	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	25	25	—	—	30	30
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „ ...	—	—	—	—	—	—
„ 4 „ ...	—	—	—	—	—	—
„ 6 „ ...	—	—	—	—	—	—
„ average ..	14/6	14/9	15/1	12	17	15/6
„ per loom	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

TABLE 8—*Contd. Average earnings in weaving, &c., Manchester and district.*

Year	1870.	1871.	1871.	1871.	1872.	1873.
Authority	10 e.	9 a.	35 a.	9 c.	6 b.	33.
	s.	s.	s.	s.	s.	s.
Winders	11	11	12, 15	—	13/6	—
Reelers	—	—	10, 15	—	13	12/6
Warpers, M.	—	—	30	—	—	26
„ W.	—	—	—	—	—	—
Drawers-in	—	—	24	—	—	—
„ helpers	—	—	5	—	—	—
Twisters-in	—	—	—	23/6	—	—
Beamers	—	—	22, 27/6	27/8	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	—	—	—
Weavers, 2 looms ...	—	—	11, 14	10/6	—	—
„ 3 „	—	—	—	—	17	—
„ 4 „	—	—	18, 22	—	20	—
„ 6 „	—	—	—	—	—	—
„ average ...	13/10	—	—	—	—	—
„ per loom ...	—	—	—	—	—	—
„ helpers ...	—	—	5	—	—	—
Dressers	—	—	26, 36	—	—	—
Sizers	—	—	—	32	—	30

Year	1874.	1876.	1876.	1877.	1877.	1877.
Authority	51 e.	35 a.	35 b.	10 a.	10 b.	10 e.
	s.	s.	s.	s.	s.	s.
Winders	—	—	10/6, 12	16	14	17
Reelers	—	12, 15	12	—	—	—
Warpers, M.	—	30, 35	45	—	—	—
„ W.	—	—	—	—	—	—
Drawers-in	—	24	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	15, 20	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	34, 36	34	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average ...	15	—	—	18	16	18/6
„ per loom ...	6	4 to 6	—	—	—	—
„ helpers ...	4/6, 5	—	—	—	—	—
Dressers	—	40, 50	—	—	—	—
Sizers	—	—	—	—	—	—

TABLE 8—*Contd. Average earnings in weaving, &c., Manchester and district.*

Year	1877.	1877.	1878.	1882.	1882 and '87	1883.
Authority	3.	37.	49.	12.	12.	3.
	s.	s.	s.	s.	s.	s.
Winders	13/4, 15	—	} 15 {	10, 20	10, 29	13, 14
Reelers	12	—		—	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	19/6, 22	—	22/6	16, 22/6	18, 21	—
Drawers-in	23, 28/7	—	—	25, 35	—	—
„ helpers	2/6, 3 *	—	—	—	—	—
Twisters-in	23	—	—	25, 35	—	—
Beamers	—	15, 20	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	42	28, 70	—	—
Weavers, 2 looms ...	12, 12/7	—	—	—	—	—
„ 3 „	18, 19	—	—	16, 18/6	16, 19	—
„ 4 „	20, 24/5	—	—	20, 25/6	20, 25/6	—
„ 6 „	—	—	—	29, 32	29, 32	—
„ average ...	—	15, 20	15	—	—	—
„ per loom	—	—	—	—	—	—
„ helpers	2/6 *	—	—	2/6, 5	—	—
Dressers	41/6	—	—	—	—	—
Sizers	35, 55	—	—	30, 45	30/9, 45	—

Year	1883.	1883.	1883.	1883.	1883.	1883.
Authority	10 a.	10 b.	10 c.	10 g.	10 h.	10 i.
	s.	s.	s.	s.	s.	s.
Winders	17/6	12/6	12	—	—	—
Reelers	—	—	—	—	—	—
Warpers, M.	—	—	—	—	—	—
„ W.	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	—	—	—	—	—
<i>Power loom weaving.</i>						
Overlookers	36, 38	33	—	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	—	—	—	17/9	18	—
„ 6 „	—	—	—	—	—	—
„ average	19/8½	15	16	—	—	15/0½
„ per loom	—	—	—	—	—	—
„ helpers	—	—	—	5/3	6	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	—	—	—

* Half time.

TABLE 8—Contd. *Average earnings in weaving, &c., Manchester and district.*

Year	1834.	1884.	1884.	1884.	1884.	1884.
Authority	21.	52.	14 A.	14 B.	14 C.	14 D.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Winders	10, 20	8, 12	—	—	11/3	—
Reelers	—	—	—	18	—	—
Warpers, M.	—	26	—	—	—	—
„ W.	18, 20	—	—	—	—	—
Drawers-in	—	26	—	—	—	—
„ helpers	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—
Beamers	—	30/6	—	—	—	—
<i>Power loom weaving</i>						
Overlookers	—	—	23	—	—	—
Weavers, 2 looms ...	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—
„ 4 „	15, 18	—	—	—	—	—
„ 6 „	—	—	—	—	—	—
„ average	—	15/3	16	20	22/6	18
„ per loom	5, 6	—	—	—	—	—
„ helpers	—	—	—	—	—	—
Dressers	—	36/6	—	—	—	—
Sizers	—	38	—	—	—	—

Year	1884.	1884.	1884.	1886.	1886.	1890.
Authority	14 E.	14 F.	14 J.	1.*	1.†	8a.
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Winders	—	—	—	11/8	12/8 {	18
Reelers	—	14	—	11/11		—
Warpers, M.	—	—	35/6	33/7	38	—
„ W.	—	—	—	15/4	18/2	—
Drawers-in	—	—	—	24/6	24/10	—
„ helpers	—	—	—	5/9	—	—
Twisters-in	—	—	—	19/5	20/3	—
Beamers	—	—	—	24/10	—	—
<i>Power loom weaving.</i>						
Overlookers	—	—	—	33/6	36/1	41, 45
Weavers, 2 looms ...	—	—	—	11/9	11/1	—
„ 3 „	—	—	—	14/9	16/1	—
„ 4 „	—	—	—	17/9	20/2	—
„ 6 „	—	—	—	—	26/6	—
„ average	15	—	—	13/3	17/1	20, 21
„ per loom	—	—	—	5/3, 7	5/2	—
„ helpers	—	—	—	—	—	—
Dressers	—	—	—	—	—	—
Sizers	—	—	—	30/3	35/2	—

* Manchester.

† Lancs and Cheshire (S. Lancs only in 1833).

TABLE 8—*Contd. Average earnings in weaving, &c., Manchester and district.*

Year	1890.	1891-92.	1891-92.	1893.	1906.	1906.	1906.
Authority	10 <i>b</i> .	7.	8.	19.	19.	2.*	2.†
	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>
Winders	14	15/3	—	16	—	12/7	14/10
Reelers	—	—	—	—	—	13/1	13/6
Warpers, M.	—	—	—	—	—	—	40/6
" W.	—	18/9	—	—	—	17/3	21/1
Drawers-in	—	—	—	—	32, 40	25	30/9
" helpers ..	—	—	—	—	—	—	—
Twisters-in	—	—	—	—	26, 33	25/9	25/7
Beamers	—	—	—	—	30, 35	—	—
<i>Power loom weaving.</i>							
Overlookers	35	—	—	—	—	39/8	42/8
Weavers, 2 looms .	—	—	—	11/4	—	11/1	13
" 3 " 	—	—	—	17	—	15/4	17/10
" 4 " 	—	—	25/3	23	—	20	24
" 6 " 	—	—	—	30/6	—	—	32/9
" average	16/6	—	20	—	20	15/2	20/8
" per loom	—	5/6	5/3	—	5/10	5/3	6
" helpers	—	—	—	—	—	—	—
Dressers	—	—	—	—	—	37/2	37/1
Sizers	—	—	—	—	—	—	43/9

* Manchester.

† Lancs and Cheshire (S. Lancs only in 1833).

As with the other tables in this section, the statements in this table are so varied and sometimes so self-conflicting that it is desirable that a rough summary be made as a suggestion of the probable course of wages in the various occupations, leaving the details to be filled in and the necessary corrections to be made when the other localities have been studied in detail. Such a summary is given in the following table. The chief gap is seen to be from 1859-61 to 1870-71. The lowest point was about 1839-41, and from that date to 1906, weavers, who form the largest group, have advanced by nearly 100 per cent., winders by about 70 per cent., reelers by about 55 per cent., and overlookers by about 55 per cent. The comparatively slow rate of change in the first half of the century agree with the summaries for other departments, and with Ellison's estimates of the average earnings of operatives employed in weaving mills, the details of which will be discussed later.

TABLE 9.—*Approximate estimates of average wages in weaving, &c., Lancashire and Cheshire, 1826-1906.*

	1826.	1833.	1839-41.	1845.	1849-50.	1853.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Winders (women)	9 6	9 6	9 -	11 -	8 6	10 6
Reelers "	10/ 12/	10 -	9 -	9 -	9 -	—
Warpers "	11 -	11 -	9 -	12 -	—	11 6
Weavers	11 -	11 -	10 6	11 6	11 -	11 6
Helpers	—	—	5 -	5 -	5 -	5 -
Overlookers	27 -	26 3	—	27 -	—	27 6
Sizers and Dressers	28 -	27 10	—	—	—	27 6

	1859-61.	1870-71.	1877.	1886.	1891.	1906
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Winders (women)	10 -	13 -	14 -	} 13 -	{ 14 6	15 3
Reelers "	9 6	13 -	13 -			13 10
Warpers "	—	—	17 -	18 -	19 -	21 -
Weavers	12 6	14 -	17 -	17 -	19 -	20 6
Helpers	5 -	5 -	5 -	—	5 9	6 -
Overlookers	—	—	35 -	36 -	—	42 6
Sizers and Dressers	—	30 -	40 -	35 -	—	40 -

Percentage changes in wages. Manchester district.

At the census of 1833 the average wage of all employed in the Manchester district was 10s. 3d. At the wage census of 1886 it was 14s. 5½d., and in 1906 16s. 3d. The returns of numbers employed and wages paid given monthly in the *Labour Gazette* show the average wage as follows:—

	s. d.		s. d.		s. d.
1905	15 7	1907	15 9	1909	15 6½
'06	15 9	'08	14 6	(January to August)	

These averages include those working short time and overtime, as well as those working the normal week. In 1906 the average of all workpeople, including those who worked more or less than full time, was 16s. at the date of the census, and 15s. 6½d. taking the mean of twelve weeks, one in each month. As we have seen, however, we cannot be sure that our statements are in the main for Manchester only; many are intended to cover the Lancashire and Cheshire district, particularly the southern portion forming the federated area, and in the following estimates are the numbers which, on the basis of the above figures, apply more particularly to Manchester in the restricted sense, as well as to corresponding numbers indicated for Lancashire and Cheshire. Previous to 1833 the Manchester figures are practically all we have for the industry, but the overwhelming proportion of the trade carried on in Manchester from 1806 to 1833 gives ground for the probability that they approximately represent the course of wages outside Scotland. From 1833 to 1906 these numbers will require further modification when we come to consider the course of wages at Oldham, Bolton, Preston, and elsewhere, and combine them into one final estimate for the whole country.

TABLE 10.—*Estimated changes in average earnings of cotton operatives employed in factories in the Manchester district, 1806-1906. (1886 = 100.)*

Year.	Manchester.	Lancashire and Cheshire.*	Year.	Manchester.	Lancashire and Cheshire.*
1806	75½	73	1855	70½	68
'10-16	79½	76	'59-61....	71½	70
'17	78½	75	'66	81½	80
'18-20	77½	75	'70	88½	87
'21-22	77	74	'71	92½	91
'23-25	73	70	'74	100	99
'26.....	73½	70	'77	105½	104
'32-33	71	68	'80	97	96
'36.....	72½	69	'83	104½	103
'37-41	65½	63	'86	100	100
'45	74½	72	1906	112½	128½
'49-51	65½	63			

* Mainly South Lancashire and Cheshire to 1886.

Oldham and District.

For the purpose of tracing the history of wages in the cotton industry, perhaps even Manchester does not exceed Oldham in importance. It is true that Manchester was the early centre of the trade, and that Oldham is merely one of the extensions, but in the spinning branch of the trade Oldham is the home of collective bargaining and the standard rate, and Oldham methods of wage arrangements have gradually extended over an ever-widening area. The Oldham spinning list, adopted in 1875, has gradually found its way into other parts until, with the possible exception of Bolton, mills spinning on it are to be found in every Lancashire and Cheshire cotton centre. The Oldham cardroom list, compiled twenty years ago, has only been superseded by one more elaborate, based on it and applicable to the whole federated area. This for cardroom purposes is practically all Lancashire and Cheshire. Further, the general advances and reductions at Oldham have for more than thirty years been followed at all the other American-using cotton centres, so that while Ashton, Preston, Blackburn, Burnley, and other places still in part spin on local lists, the terms of the Brooklands Agreement and the advances and reductions made under it are observed by them.

In view of these considerations, it is unfortunate that we have not for Oldham itself a series of statements made by the local Chamber of Commerce in each year when inquiries were instituted by the Board of Trade, and the returns were published in the "Tables of the Revenue." There is much reason to believe that some of the material given under the section relating to Manchester and district really emanates from Oldham, but we cannot now identify it. Oldham being the centre of fustian and velveteen weaving, it is almost certain that the details given by Chadwick for velveteen weavers relate to this district, and have been tabulated on this assumption. We have been able, fortunately, to remedy the defects in our material by obtaining some returns for certain

TABLE 11.—OLDHAM AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1833-1906.*

	Year	Authority	1833.		1833.	1836-7.	1839.	1841.	1841.	1841.	1849.
			4 and 40.		26a.	26a.	*	26a.	26b.	25c.	*
			No.	Av.							
				s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Blowroom women.....	W.	—	—	—	—	—	—	—	—	—	—
Mixers	M.	—	—	—	—	—	—	—	—	—	—
Scutchers	M.	—	—	—	—	—	—	—	—	—	—
Carding overlookers.....	M.	—	—	—	—	—	—	—	—	—	—
Strippers and grinders...	M.	—	—	—	15 8	14 6	—	14 6	—	—	13/-, 14/-
Lap tenters	M.	—	—	—	—	—	—	—	—	—	—
Draw-frame tenters	W.	—	7 11	8 —	9 —	—	9 —	—	—	—	8 —
Slub-frame tenters	W.	—	6 4	4 6, 8/-	6/-, 8 3/6	—	6/-, 8 3/6	—	—	—	—
Inter-frame tenters	W.	—	—	—	—	—	—	—	—	—	—
Rover tenters	W.	—	7 7	—	—	—	—	—	—	—	8/-, 9/-
Tenters' average	W.	—	—	—	—	—	—	—	—	7/- to 12/6	—
Little or back tenters ...	G.	—	—	3/-, 4 6	4 6, 5/6	—	4 6, 5/6	—	—	—	—
Spinning overlookers ...	M.	—	23 1	—	—	—	—	—	—	—	—
Spinners	M.	—	26 1	29 10	26 10	—	24 7 1/2	25/-, 26/-	21 —	—	—
Big piecers	L. & M.	—	—	8 4, 5/-	10/3,	—	8/9,	—	9/-, 7/-	—	—
Little piecers	L.	—	—	3/-	6/3, 4/-	—	5/6	—	5/-	—	—
Half-time piecers	L.	—	2 7	—	—	—	2 9	—	—	—	—
Piecers' average	L. & M.	—	6 2	—	—	—	—	—	—	—	—
Twiners	M.	—	—	—	—	—	—	—	—	—	—
Ring and throstle } overlookers	M.	—	22 7	—	—	—	—	—	—	—	—
Ring or throstle spin- } ners	W. & G.	—	6 7	—	—	—	—	—	—	—	—
Winders	W. & G.	—	—	—	—	—	—	—	—	—	—
Reelers	W. & G.	—	—	—	—	—	—	—	—	—	—
Doublers	W. & G.	—	—	—	—	—	—	—	—	—	—
Warpers	W.	—	12 7	—	—	—	—	—	—	—	—
Weaving overlookers ...	M.	—	24 8	—	—	—	—	—	—	—	—
Weavers, 2 looms	L. W. & G.	—	—	—	—	—	—	—	—	—	—
„ 3 „	L. W. & G.	—	—	—	—	—	—	—	—	—	—
„ 4 „	W. & M.	—	—	—	—	—	—	—	—	—	—
„ average	—	—	10 9	15 —	18 —	—	12 4 1/2	10 6	—	—	—
Fustian weavers, 2 looms	L. W. & G.	—	—	—	—	—	—	—	—	—	—
„ 3 „	L. W. & G.	—	—	—	—	—	—	—	—	—	—
„ 4 „	W. & M.	—	—	—	—	—	—	—	—	—	—
„ average	—	—	—	13 8	13 6	12 0	13 6	—	—	—	12 0
Weavers' assistants ...	L. & G.	—	—	3 6, 4 3	4/-, 4 9	—	4/-, 4 3/8	—	—	—	—
Dressers	M.	—	29 5	—	—	—	—	—	—	—	—
Sizers	M.	—	—	—	—	—	—	—	—	—	—
Warehousemen and } packers	M.	—	—	—	—	—	—	—	—	—	—
Totals and averages } of all employed ...	—	—	3,775	10 7	—	—	—	—	—	—	—

* The figures for fustian weavers are from Chadwick, and those for tenters and grinders in 1849 are from a speech by Mr. T. Emmott of Oldham in 1889.

TABLE 11—*Contd.* OLDHAM AND DISTRICT. *Average earnings of cotton operatives, 1833-1906.*

	Year	1859.	1860.	1866.	1870.	1870.	1871.	1880.	1882.	1882.
		Authority	*	17a.	8.	17a.	17b.	9.	17a.	25.
			s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Blowroom women.....	W.	—	—	—	—	—	—	—	—	—
Mixers	M.	—	—	—	—	—	—	—	—	—
Scutchers	M.	—	—	—	—	—	16/-, 22/-	—	—	—
Carding overlookers.....	M.	—	—	—	—	—	26/-, 50/-	—	40/-, 50/-	—
Strippers and grinders...	M.	—	16 3	—	19 4	20 -	18/-, 22/-	22 3	22/-, 24/-	—
Lap tenters	M.	—	—	—	—	—	—	—	—	—
Draw-frame tenters	W.	—	11 7	—	14 3	14 9	—	16 -	16/3, 19/-	—
Slub-frame tenters	W.	—	10 3	—	12 3	10 -	—	15 4	16/3, 19/-	—
Inter-frame tenters	W.	—	—	—	—	—	—	—	—	—
Rover tenters	W.	—	11 10	—	14 2	13 3	—	15 -	15/6, 19/-	—
Tenters' average	W.	—	—	13 -	—	14 4	—	—	—	—
Little or back tenters ...	G.	—	—	—	—	13 4	—	—	9 -	—
Spinning overlookers	M.	—	—	—	—	6 6	—	—	40/-, 50/-	—
Spinners	M.	—	27 10	—	31 3	—	25/-, 35/-	32 11	—	30/-, 36/-
Big piecers	L. & M.	—	—	—	—	31 6	13/-, 15/-	—	—	—
Little piecers	L.	—	—	—	—	14 6	9/-, 11/-	—	—	—
Half-time piecers	L.	—	—	—	—	10 6	—	—	—	—
Piecers' average	L. & M.	—	11 -	—	12 -	—	—	12 5	—	9/6, 16/6
Twiners	M.	—	—	—	—	—	—	—	—	—
Ring and throstle } overlookers	M.	—	—	—	—	—	—	—	—	—
Ring or throstle spin- } ners	W. & G.	—	—	—	—	—	—	—	—	—
Winders	W. & G.	—	11 6	—	14 -	—	—	14 2	—	—
Reelers	W. & G.	—	—	—	—	—	—	—	—	—
Doublers	W. & G.	—	—	—	—	—	—	—	—	—
Warpers	W.	—	—	—	—	—	—	—	—	—
Weaving overlookers ...	M.	—	—	—	—	—	26/-, 34/-	—	—	—
Weavers, 2 looms	L. W. & G.	—	—	—	—	—	14/-, 15/-	—	—	—
" 3 "	L. W. & G.	—	—	—	—	—	—	—	—	—
" 4 "	W. & M.	—	—	—	—	—	18/-, 25/-	—	—	—
" average	—	—	—	—	—	—	—	—	—	—
Fustian weavers, 2 looms	L. W. & G.	—	—	—	—	—	—	—	—	—
" 3 "	L. W. & G.	—	—	—	—	—	—	—	—	—
" 4 "	W. & M.	—	—	—	—	—	—	—	—	—
" average	—	14 0	11 9	—	14 10	—	—	15 8	—	—
Weavers' assistants	L. & G.	—	—	—	—	—	—	—	—	—
Dressers	M.	—	—	—	—	—	—	—	—	—
Sizers	M.	—	—	—	—	—	25/-, 32/-	—	—	—
Warehousemen and } packers	M.	—	—	—	—	—	—	—	—	—
Totals and averages } of all employed ... }	—	—	—	—	—	—	—	—	—	—

* The figures for fustian weavers are from Chadwick.

TABLE 11—*Contd.* OLDHAM AND DISTRICT. *Average earnings of cotton operatives, 1833-1906.*

	Year	Authority	1883.	1884.	1884.	1884.	1884.	1884.	1884.		1890.
			3.	18.	21a.	21b.	21c.	21.	1.		17a.
									No.	Av.	
Blowroom women.....	W.		<i>s. d.</i> 14/-, 15/-	<i>s. d.</i> 14 -	<i>s. d.</i> 14 -	<i>s. d.</i> —	<i>s. d.</i> —	<i>s. d.</i> —	147	<i>s. d.</i> 14 1	<i>s. d.</i> —
Mixers	M.		—	20/-, 22/-	21 -	—	—	—	147	19 -	—
Scutehers	M.		18/-, 24/-	—	—	21 6	21 -	—	167	20 7	—
Carding overlookers.....	M.		30/-, 60/-	—	40 -	38 -	42 -	—	{ 72	40 10	—
Strippers and grinders...	M.		20/-, 23/-	23 -	22 6	23 -	22 3	—	{ 55	24 8	—
Lap tenters	M.		—	22 -	—	—	—	—	399	21 10	24 7
Draw-frame tenters	W.		15/-, 20/-	—	17 6	17 9	19 -	—	38	18 9	—
Slub-frame tenters	W.		{ 14/6,	{ —	17 -	17 6	18 6	—	458	17 4	18 11
Inter frame tenters	W.		{ 18/-	{ —	—	—	—	—	1,697	16 5	17 5
Rover tenters	W.		—	—	16 -	16 -	16 6	—	—	—	17 -
Tenters' average	W.		—	16 -	—	—	—	—	{ 2,155	16 8	—
Little or back tenters ...	G.		7/-, 10/-	—	3/9, 4/-*	—	—	—	724	8 4	—
Spinning overlookers ...	M.		36/-, 50/-	—	41 -	42 -	45 -	—	92	3 5*	—
Spinners	M.		30/-, 45/-	34 -	34 6	33 -	31 -	35/3, 36/3	63	43 1	—
Big piecers	L. & M.		{ 10/- to {	{ 15 -	10 6	—	—	15/-, 16/-	1,477	33 2	37 -
Little piecers	L.		{ 18/-	{ 11 6	—	—	—	9/-, 11/-	1,468	15 2	—
Half-time piecers	L.		2/6, 4/6	3 1	4 6	—	—	3/6, 4/3	1,330	11 0	—
Piecers' average	L. & M.		—	—	—	11 3	10 6	—	211	4 -	—
Twinders.....	M.		32/-, 38/-	34 6	—	—	—	—	{ 2,798	13 2†	{ 12 10
Ring and throstle } overlookers	M.		28 -	—	—	—	—	—	3,009	12 7‡	—
Ring or throstle spin- } ners	W. & G.		14/-, 16/-	—	—	—	—	—	8	27 11	—
Winders	W. & G.		16/-, 18/-	14 6	—	16 6	16 -	—	170	13 6	—
Reelers	W. & G.		—	—	12/6, 20/-	—	—	—	133	13 4	14 6
Doublers	W. & G.		—	—	—	—	—	—	700	13 2	—
Warpers	W.		16/-, 19/-	19 -	18 -	17 4	18 -	—	—	—	—
Weaving overlookers ...	M.		—	43 -	—	37 -	38 -	—	27	17 5	—
Weavers, 2 looms	L. W. & G.		—	—	—	—	—	—	63	36 7	—
" 3 "	L. W. & G.		—	—	—	—	—	—	?	10 -	—
" 4 "	W. & M.		—	—	—	—	—	—	117	14 10	—
" average	—		{ 5/8 per loom }	—	{ 5/4 per loom }	5/4 per loom }	—	—	172	19 9	—
Fustian weavers, 2 looms	L. W. & G.		—	12 9	—	—	—	—	289	17 9	—
" 3 "	L. W. & G.		—	18 -	—	—	—	—	—	—	—
" 4 "	W. & M.		—	23 -	—	—	—	—	—	—	—
" average	—		{ 6/- per loom }	{ 17/- }	{ 6/- per loom }	—	—	—	—	16 10½	16 -
Weavers' assistants	L. & G.		4/6, 6/-	—	4/-, 5/-	—	—	—	{ 80	5 6	—
Dressers	M.		—	—	—	—	—	—	193	2 7	—
Sizers	M.		—	—	—	—	—	—	14	39 5	—
Warehousemen and } packers	M.		22/-, 28/-	—	26 -	24 -	22 -	—	249	22 0	—
Totals and averages } of all employed ... }	—		—	—	—	—	—	—	11,567	17 2	—

* Half time.

† Excluding half timers.

‡ Including half timers.

§ The average is for all places except Halifax.

|| Average fustian, velveteen, &c., weavers, all places. See text.

TABLE 11—*Contd.* OLDHAM AND DISTRICT. *Average earnings of cotton operatives, 1833-1906.*

	Year	1890.	1891.	1891.	1892.	1900.	1901.	1906.	1906.	
		Authority	48.	8.	17b.	47.	17a.	17a.	2.	
			s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	No.	Av.
Blowroom women.....	W.	—	—	17 7	—	—	—	—	—	—
Mixers	M.	—	—	20 6	—	—	—	—	212	22 8
Scutchers	M.	—	—	23 —	—	—	—	—	263	28 6
Carding overlookers	M.	—	—	37 —	—	—	—	—	191	42 3
Strippers and grinders...	M.	} 25 — {	} 26 4	25 10	26 5	29 5	—	30 5	574	30 11
Lap tenters	M.			24 4	—	—	—	—	—	—
Draw-frame tenters	W.	19 6	—	19 7	—	22 —	21 3	23 —	763	22 9
Slub-frame tenters	W.	19 —	—	18 4	—	20 7	21 —	21 9	439	22 2
Inter-frame tenters	W.	19 6	—	18 4	—	} 19 6 {	} 20 10 {	} 20 8 {	587	20 9
Rover tenters	W.	17 10	—	17 10	—				1,945	19 8
Tenters' average	W.	—	—	18 5	18 0	—	—	—	4,225	20 10*
Little or back tenters ..	G.	9 —	9 4	—	9 —	—	—	—	—	—
Spinning overlookers ...	M.	—	—	—	—	—	—	—	151	46 2
Spinners	M.	—	—	37 —	—	39 8	—	42 1	3,165	41 10
Big piecers	L. & M.	—	—	16 3	—	—	—	—	3,155	19 4
Little piecers	L.	—	—	11 6	—	—	—	—	2,953	14 —
Half-time piecers	L.	—	—	—	—	—	—	—	—	—
Piecers' average	L. & M.	—	—	—	—	14 8	—	15 6	6,108	16 9
Twiners.....	M.	—	—	—	—	—	—	—	68	41 2
Ring and throstle } overlookers	M.	—	—	—	—	—	—	—	—	—
Ring or throstle spin- ners	W. & G.	—	—	—	—	—	13/-, 18/-	—	624	16 4
Winders	W. & G.	—	—	—	—	15 —	} 16/-, } 17/6 }	} 16 4	1,169	14 3
Reelers	W. & G.	—	—	—	—	—			873	14 4
Doublers	W. & G.	—	—	—	—	—	} 16/-, 17/- 17/6, 18/- }	} —	179	16 2
Warpers	W.	—	—	—	—	—			120	19 10
Weaving overlookers ...	M.	—	—	—	—	—	—	—	92	38 7
Weavers, 2 looms	L. W. & G.	—	—	—	—	—	—	—	250	11 10
„ 3 „	L. W. & G.	—	—	—	—	—	—	—	628	16 6
„ 4 „	W. & M.	—	—	—	—	—	—	—	394	21 3
„ average	—	—	—	—	—	—	—	—	1,272	17 1
Fustian weavers, 2 looms	L. W. & G.	—	—	—	—	—	—	—	209	12 7
„ 3 „	L. W. & G.	—	—	—	—	—	—	—	692	18 6
„ 4 „	W. & M.	—	—	—	—	—	—	—	107	22 11
„ average	—	—	—	—	—	16 3	—	16 11	1,008	17 5
Weavers' assistants	L. & G.	—	—	—	—	—	—	—	—	—
Dressers	M.	—	—	—	—	—	—	—	—	—
Sizers	M.	—	—	—	—	—	—	—	—	—
Warehousemen and } packers	M.	—	—	—	—	—	—	—	810	28 3
Totals and averages } of all employed ... }	—	—	—	—	—	—	—	—	26,805	21 —

* Including 491 tenters unclassified at an average of 21s. 1d.

years from a couple of large firms, and while these may not be quite typical as regards the averages in any particular year, the rates of change will probably be near the truth. It should be noticed, however, that no group of mills, however many may be employed, can correctly represent the changes in average earnings over a long period, if they have been in existence all the time. The tendency being to put in larger machinery, involving a question of space, old mills have often to renew their machinery without adding to the spindleage, because there is not space for extensions. Some firms have actually had to put in ring frames and spin ring yarn because their mills would not, when the old mules were taken out, contain the mules of the size with which it has been desired to replace them. The total effect of all the changes in, and additions to, the machinery of a district can only be estimated when a general census is taken. This, of course, applies to all trades more or less, but its application to the textile trades is very particularly direct.

Table 11 gives the details relating to average earnings in a normal week at various dates.

Card and blowing-room operatives.

In 1890 the Oldham employers and the card- and blowing-room operatives agreed on a list of standard wages for standard machines. The list rates are not earnings, but, like the gross wages of the Oldham spinning list referred to below, are the basis for calculating the piece prices to be paid on machines of all sizes, in accordance with the standard rate for the standard machine. These conditions remained in operation for several years, being superseded by more elaborate lists for a wider area. At the commencement they were practically a co-ordination and standardisation of conditions then in vogue. In 1903 a Universal list for cards superseded the portion of the Oldham list dealing with strippers and grinders, and extended over the "federation area," a not quite clearly defineable area, but covering Manchester, Oldham, Ashton, Rochdale, and practically all the South Lancashire district, not necessarily including Bolton, though many Bolton employers have adopted it. It has also extended in a few cases to towns in north and north-east Lancashire. The basis of the list is a payment of 2s. per card for a standard weight carded, the number of men employed being regulated as far as possible to yield 14 cards per man. As the conditions vary as to the amount of cotton carded and the number of cards in a mill, and provisions are also made for extra payment where no under-carder is employed, where cards are ground more often than three-fourths of the total number of cards per week, and other features, the standard wage is, of course, only a measuring point. Under the Oldham card-room list, the basis was a standard rate of 24s. per week, with modifications for various conditions. These men are classed as time workers or "datal hands," but as their rates of pay depend on the usual amount of work to be done, and they have to get that amount of work done, they are, in reality, piece-workers. No operatives in the trade have had their wages advanced to as great an extent as the "card-room jobbers," as they are now called, and this advance has been a part of a deliberate policy to create an

additional skilled employment, replacing one hitherto quite or nearly unskilled, and greatly reducing the number of men employed. The machinery is totally different from what it was fifty or less years ago, and the number of men employed is reduced by more than one-half. In the case of the frame tenters, the rates were the base rates for standard lengths of machines, namely, slubbers, 84 spindles; intermediates, 124 spindles; and rovers, 164 spindles. 1 per cent. was to be added or deducted, as the case may be, for every 4 slubber, 6 intermediate, and 8 rovers spindles over or below the standard size. These rates are given in the table below, with the corresponding rates after general advances or reductions had been agreed to. In 1907 a new list for frames, again a "Universal list," was agreed to. This list states the standard conditions for 55½ hours, and to it was to be added a 5 per cent. advance conceded on the third pay day in May, 1906. In 1907 a further advance of 5 per cent. was conceded, but this was taken off early in 1909. In this list medium counts on frames of the same size as were taken for the Oldham list standard in 1891 are the starting point, with additional payments of 5 per cent. and 10 per cent. respectively on coarse and very coarse counts, and a reduction of 5 per cent. on fine counts. The Universal list varies little from its predecessor in the Oldham district, and might almost be called an elaboration of it. It is significant of the possible variations in earnings under this list that the employers' edition of it, with the corresponding rates calculated from the standard for various sizes of machines, shows rates varying from 17s. 5d. to 31s. 10d. for drawing frame tenters; from 17s. 8d. to 29s. 3d. for big, and 8s. 10d. to 13s. 7d. for little or back slubber tenters; from 15s. 7d. to 30s. 8d. for big, and from 8s. 6d. to 14s. 5d. for little intermediate tenters; and from 12s. 5d. to 34s. 7d. for big, and 8s. 1d. to 17s. 3d. for little roving frame tenters (doffers). This list came into operation on May 1, 1907, at the option of either employer or employed in any mill at which it was desired.

As with spinning so with frame tenting, there are tendencies to increase apart from the general advances conceded from time to time. As the smaller frames are taken out and larger ones are put in, so the average earnings will increase apart from any general changes. Here, as elsewhere, the tendency toward larger and more efficient machinery is continuous, probably, as with spinning, operating with greater pressure during a period of active building and extension than during more quiet times.

The standard rates under the Oldham and Universal lists are given in the following table. From 1889 to 1901 all the rates are the Oldham list rates. In 1902 hours were reduced by one per week and "dotal hands" were reduced *pro rata*, the grinders' standard being 28s. 6d. after the change. Piece workers in the majority of cases made up the difference at once by increased effort, so that the figures for 1900-01 practically represent 1902-05 also. For 1905-07 the rates are "Universal" list rates, except for opener feeders and engine head tenters, who are not included in the "Universal" lists.

TABLE 12.—“Standard rates” under the Oldham and Universal Lists for card- and blowing-room operatives.

	1889-90.		1891-92 Standard.		1893-98.		1899.		1900-01.		1905.		1906.		1907-08.		1909.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Opener feeders	16	9	18	5	17	11	18	5	20	3	20	—	20	11	21	10	20	11
Weighters and feeders	13	—	14	4	13	10	14	4	14	11	14	9	15	6	16	1	15	6
Lap tenters.....	16	—	17	7	17	1	17	7	—	3	—	—	—	—	—	—	—	—
Strippers and grinders	23	4	25	8	24	11	25	8	28	3	—	—	29	5	30	10	29	5
Engine head tenters	24	—	26	5	25	8	26	5	29	1	28	—	12	2	12	9	12	2
Frame tenters—	10/9, 11/3		11/3, 11/9		10/11, 11/5		11/3, 11/9		—		—		—		—		—	
Drawing	19	3	20	3	19	8	20	3	21	3	19/9, 21/3, 22/9		20/9, 22/4, 23/11		21/9, 23/5, 25/—		20/9, 22/4, 23/1	
Single slubbers	18	6	19	5	18	10	19	5	20	5	20	—	21	—	22	—	21	—
Pair of	19	3	20	3	19	8	20	3	21	3	21	6	22	—	23	8	22	7
Slubber and intermediate	19	3	20	3	19	8	20	3	21	3	21	3	22	4	23	5	22	4
Pair of intermediates	19	—	20	—	19	5	20	—	21	—	21	—	22	1	23	1	22	1
Single	16	6	17	4	16	10	17	4	18	2½	18	—	18	11	19	10	18	11
Intermediate and rover	18	6	19	5	18	10	19	5	20	5	20	—	21	—	22	—	21	—
Pair of rovers	17	6	18	4½	17	10	18	4½	19	3½	19	—	19	11	20	11	19	11
Odd rovers	13	3	13	11	13	7	13	11	14	7	14	6	15	3	15	11	15	3
Back tenters, inter- mediates, slubbers.....	9	—	9	5	9	2	9	5	9	11	9/10, 10/—		10/4, 10/6		10/10, 11/—		10/4, 10/6	
Rovers.....	8	6	8	11	8	8	9	2	9	5	9	6	10	—	10	5	10	—

Frame tenters are not all women, but frame tenting is a woman's work, and nearly all tenters are of 18 years of age and up. The Census of Wages Report, 1906, does not mention girl frame tenters at all, though there would probably be 200-300 all together in the Oldham district, mainly on single slubbers and rovers. If they had been stated separately the average for all frame tenters in Table 11 would have been slightly reduced, but perhaps not by more than 2*d.* or 3*d.*

It is interesting to notice the way in which the stripper and grinder has progressed. A reference to the table of percentage levels under the various lists given in Table 1³ shows the general changes for Oldham district card and blowing room males from 1871. In 1886, as the wage census shows, the average wage was only 21*s.* 10*d.*, or little better than a labourer's wage. By that date, however, some firms had been giving their grinders extra work and the average is kept down by the stripper, the two occupations not having been entirely amalgamated. The main change came with the abandonment of the old roller and clearer cards and the introduction of the revolving flat cards in the latter "eighties," but it had been going on before. In 1871 about 20*s.* per week was the average, the grinder being about 1*s.* better paid than the stripper. The advance in 1873 of 1*s.* 6*d.* usually conceded made the wages 21*s.* to 23*s.*, and no change is recorded after until the reduction of 1877⁴. If no other changes had taken place, the wages in 1906 would have been 18·8 per cent. above those of 1876, that is, about 26*s.* 2*d.* The average earnings, however, are 30*s.* 11*d.*, or over 40 per cent. above the probable average of 22*s.* then. Speaking in 1889, Mr. T. Emmott, M.P., stated that "forty years ago Oldham jobbers had 13*s.* or 14*s.*, now they are grumbling at 24*s.*"

In addition to the material given for spinners in Table 11, I have been fortunate in obtaining a memorandum book, mainly relating to the period 1870-72, containing the details of the gross wages of spinners, the amount paid for piecing, the size and speed of the mule, and other more technical details. The particulars relate to between 300 and 400 pairs of mules, of all sizes, in nearly 100 different mills. With the aid of these details we are able to make some intricate calculations. The following is a tabulation :—

³ *Journal of the Royal Statistical Society*, January, 1910, pp. 41 and 42.

⁴ A local newspaper stated in January, 1875, that the employers had decided that male datal hands were to have the same wages for 56½ hours as for 59 when the Factory Act reduced the working week.

TABLE 13.—*Particulars of earnings of spinners and piecers, Oldham, circa 1870-72.*

Number of dozen spindles.	Piecers.					Mindors.		
	Number of observa- tions.	Number of piecers.		Average earnings.		Number of observa- tions.	Average gross earnings.	Average net earnings.
		Full time.	Half time.*	Pair of mules.	Full-time piecer.			
				s. d.	s. d.		s. d.	s. d.
Up to 44	24	24	2	14 4	13 9	16	43 9	29 5
45-48	8	8	0	12 11	12 11	0	—	—
49-52	20	29	2	19 2	12 9	24	46 6	27 4
53-56	23	27	5	16 1	12 6½	23	49 —	32 11
57-60	27	30	14	18 9	13 8	24	47 8	28 11
61-64	11	19	3	22 1	11 10	6	48 4	26 3
65-68	24	46	2	23 3	11 10	20	53 6	30 3
69-76	88	176	0	24 5	12 2½	81	55 10	31 5
77-84	80	161	0	24 6	12 2½	77	57 4	32 10
85-88	34	68	0	24 7½	12 4	29	57 2	32 6½
89-92	17	35	0	25 6	12 4½	19	57 2	31 8
93-96	9	18	0	25 11	13 —	5	60 6	34 7
97-100	2	5	0	31 —	12 5	1	67 6	36 6
100 and upwards	4	10	0	30 11	12 4½	3	67 8	41 9
	371	656	28	22 5	12 5	328	53 11	31 6

* Other than where two half-time little piecers took the place of one full-timer.

When the Oldham list was being compiled in 1875, both employers and spinners made extensive inquiries. The results of one of these inquiries are referred to below. The underlying reason for the introduction of this list was that previously spinners made their own arrangements as to wages of piecers, and that from 1871 to 1875, when no recognised advance in spinners' piece rates took place, constant agitation was going on by the piecers for advances. When, as frequently happened, an advance was obtained, the spinners, who were the losers, applied to their employers for a readjustment of piece rates to compensate them for the increased cost of piecing. We have several instances of the employers paying 1s., 1s. 6d., or 2s. per week to the piecers, independent of their wage from the minders. This plan was adopted to save a revision of piece prices. In 1875 hours were reduced by the Factory Act to 56½ per week, and the piecers took concerted action to maintain their old 59 hours' wages for a 56½ hours' working week. The spinners accordingly "brought in a new list which would have made their wages 15 per cent. to 20 per cent. higher for 56½ hours than they were for 59. The masters refused and then the men demanded an advance of 10 per cent. on the old list."⁵ They were then earning 26s. to 36s., according to the same authority. The outcome of this was that a "gross list" was agreed

⁵ *Capital and Labour*, 11th August, 1875.

upon. This list stated the gross earnings for minders and piecers on mules varying from 36 to 116 dozen spindles, in the following form (taking a then very typical size of mule) :

Number of dozens.	Total earnings.	Percentage (spinners).	Percentage (piecers).
75	£ s. d. 2 18 -	55.18	44.82

The total earnings are the amount which should be earned by minders and piecers, and the prices for the various counts spun are calculated accordingly. There were, of course, other particulars, some of which will be referred to later, two being the important scale of payment for "over-speed," and the payment of 1s. per week extra for spinning pin cops, that is, weft for weavers shuttles. Had this list been strictly adhered to, piecers' wages would vary from year to year exactly in proportion with those of spinners. The Secretary of the operatives, however, translated the list percentages to minders and piecers into actual money, and a standard wage for piecers varying according to the number of spindles in a pair of mules has been operative ever since. Apart from percentage list changes, therefore, piecers' wages will only have advanced with the increased average size of the mules.

The following table will indicate what that advance has been :—

TABLE 14.

	1870-72 (all sizes).	1871-72 (69—84 dozens).	1874 (69—84 dozens).	1876 (69—84 dozens).	1886 (all sizes).	1906 (all sizes).	Advance percent. 1886- 1906.
Minders, gross	53/11	56/6	58/-	58/9	58/9	73/10	25.8
Piecers, per minder	22/5	24/6	26/10	26/6	25/7	32/-	25.0
Minders, nett	31/6	32/-	31/2	32/3	33/2	41/10	26.1
Big piecers, average	—	—	—	—	15/2	19/-	25.3
Little piecers, aver- age*.....	—	—	—	—	10/9½	14/-	29.6
All piecers, average,*	12/5	12/2½	13/5	13/3	13/-	16/7	27.7
Level of list prices	—	—	—	100	85	105	23.5

* Two half-timers where known being taken as one full-timer.

These figures consist of an extract for 1870-72 from the previous table, showing the earnings on mules of 69—84 dozen spindles; for 1874, of a summary of similar particulars according to a "list" compiled by the operatives; and for 1876 of similar details from the Oldham list. In 1874-76 these undoubtedly reflect the average earnings very closely. By comparison with the census of 1886 and 1906 we see the changes which have taken place between two periods. Acting on the principle that all changes in size, speed, &c., have been brought about uniformly between the two periods, we are able by the percentage list changes to interpolate very nearly the earnings of both piecers and spinners from 1876 to 1907, but not later, because a very important alteration to the list came into

operation in January, 1908, as the rest of the agitation over the "fine counts" question.

A study of the whole of the evidence suggests the following averages, with an advance to piecers between 1833 and 1836, and a reduction by 1851. Wages in 1853 were stated in Dunckley's *Charter of the Nations* to have been about the same as in 1846.

TABLE 15.—*Estimated wages of spinners and piecers, Oldham, 1833-1906.*

	Spinners.		Piecers (average).			Spinners.		Piecers (average).	
	s.	d.	s.	d.		s.	d.	s.	d.
1833.....	26	1	6	2	1889.....	35	3	13	10
'41.....	24	—	7	—	'90.....	35	4	13	10
'60.....	28	—	11	—	'91.....	37	3	14	11
'71.....	31	6	12	6	'92.....	37	3	14	11
'74.....	31	2	13	5	'93.....	36	2	14	4
'75.....	31	—	13	—	'94.....	36	2	14	4
'76.....	32	3	13	3	'95.....	36	8	14	4
'77.....	31	3	12	10	'96.....	36	2	14	4
'78.....	28	7	11	8	'97.....	36	2	14	4
'79.....	27	5	11	1	'98.....	36	3	14	4
1880.....	29	8	11	11	'99.....	37	7	14	10
'81.....	32	1	12	10	1900.....	39	7	15	8
'82.....	32	8	13	—	'01.....	39	7	15	9
'83.....	33	4	13	3	'02.....	39	7	15	9
'84.....	33	11	13	5	'03.....	39	8	15	10
'85.....	32	7	12	10	'04.....	39	8	15	10
'86.....	33	2	13	—	'05.....	39	8	15	11
'87.....	33	3	13	—	'06.....	41	10	16	7
'88.....	35	3	13	10					

Since 1875 little piecers have averaged about 40 per cent. of the gross wage for big and little piecers, so that if the piecers' average here given is multiplied by 2, about 60 per cent. will represent the big piecers' wage and 40 per cent. that of the little piecer.

It is to be noticed that if these figures fairly represent the facts an appreciable slackening of the rate of advance, apart from actual list changes, took place after 1886. For this slackening there is some probability. In the first case, speeds were greatly increased after the introduction of the list in 1876. By the list, 3 draws, that is 3 travels of the carriage in and out, for a 63-inch stretch, in fifty seconds, was taken as the standard, and all quicker speed than this was to be paid for as "over-speed." The method of payment was, that for every second quicker than 3 draws in fifty seconds an addition to the gross earnings of $6\frac{1}{4}d.$ for mules of 64 dozen spindles, $7\frac{1}{4}d.$ for 80, and $7\frac{1}{2}d.$ for 92 dozen spindles was to be paid. Now, in 1876, 3 draws in fifty seconds was a quick speed. In 1870-72, out of nearly 400 observations only 15 pairs of mules ran quickly enough to qualify for payment for overspeed if the arrangement had been in existence. To-day the overspeed basis is 3 draws in forty-four seconds. By 1876 the average could not have been 3 in 50, or this would not have been the basis of the

overspeed clause. Probably, after the reduction of hours in 1875, and during the subsequent trade depression, when margins between raw cotton and yarn prices were appreciably finer, this means of economising was extensively adopted. Mr. Samuel Andrew, writing to the *Oldham Examiner and Courier* in August, 1885, gives numerous instances of the earnings on the same mules in 1877, when prices were at list net, and 1885, when prices were at 10 per cent. below. On the weft mules the averages were—

	Gross.		Piecers.		Mindors, nett.	
	s.	d.	s.	d.	s.	d.
1877.....	71	9	34	5	37	3
1885.....	69	7	31	—	38	7

and on the twist mules—

	s.		s.		s.	
	d.		d.		d.	
1877.....	63	2	27	—	36	2
1885.....	59	10	24	4	35	6

Actually, in 1885, they should have been 64s. 7d. weft, gross, and 56s. 10d. twist, gross, if no alteration in speed had taken place. They were, therefore, 5s. and 3s. above these earnings. Mr. Andrew ascribes the improvement to increased speed and improved machinery and material. Of course, the examples were all based on observations of large mules, and the average earnings are not typical, though the ratio between 1877 and 1885 may be.

Twining.

Oldham is also a centre for “twining,” that is, doubling yarn on mules instead of on frames. In the Wage Census, 1886, Report, “twining” was given separately from spinning and weaving, and all places except Halifax were amalgamated. In 1906 the details are given of twiners’ earnings at Oldham and “Yorkshire district.” We cannot tell how far Oldham predominates in the figure for 1886, but probably Oldham twiners formed the bulk of the returns, and the figure for all places except Halifax has been given in the Oldham tabulation. The figures are not of much consequence as we have so few details for this occupation, but in Oldham the wages of twiners have, according to the evidence of a high authority, always approximated to those of spinners. The census returns bear the statement out.

Weaving.

Oldham has never been much of a centre for plain calico weaving, but it is the chief centre for weaving of fustians and velveteens. In 1906, of 1,511 weavers (all working full time) returned to the Census, 1,008, or two-thirds, were in the Oldham district, 390 in the Yorkshire district, and the rest were not in any case a large enough group to be separately stated. There are two

special features about this branch of the trade, one being that it has almost invariably been busy when the ordinary calico trade has been slack, *e.g.*, 1879, 1886, 1893-94, and the other, that the number of looms per weaver is low and has not appreciably increased for thirty years. In 1886 the whole of the fustian weavers were given together in one section; in 1906 we have details for the two districts mentioned above. The comparison is as follows:—

	1886.			1906.		
	Looms per weaver.	Average per loom.	Average per weaver.	Looms per weaver.	Average per loom.	Average per weaver.
		<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>		<i>s.</i> <i>d.</i>	<i>s.</i> <i>d.</i>
Oldham	—	—	—	2·9	6 0·1	17 5
United Kingdom	3·16	5 3·6	16 10½	3·2	5 9·4	18 6

At Oldham, between 1886 and 1906, there was a slight increase of looms per weaver, mainly owing to the fact that the trade, which was then busy, had for some years been depressed, and the higher wages in the card room had attracted those who would otherwise have been weaving recruits. In the meantime, the proportion of the trade done at Oldham has increased, and as there are practically no men weavers and few women four-loom weavers at Oldham, and over one-half of the weavers in other districts are men on four looms, the effect of the change in the distribution of the trade has been to keep the average looms per weaver down.

In 1833, the average wage per head of all employed was 10*s.* 7*d.*; in 1886 it was 17*s.* 2*d.*, and in September, 1906, 21*s.*, for those working full time, and 20*s.* 7*d.* for all, including those working more or less than full time. The *Labour Gazette* monthly returns meant for the year show the following averages per head of all employed full-, over-, and short-time workers included:—

	<i>s.</i> <i>d.</i>		<i>s.</i> <i>d.</i>		<i>s.</i> <i>d.</i>
1905	19 10	1907	21 2½	1909	19 6
'06	20 5	'08	20 5	(January to August)	

The wage census shows 20*s.* 7*d.* as the mean of twelve monthly statements in 1906. The following index numbers show the changes in average wages in the Oldham district calculated from details given in the previous tables and adjusted in conformity with these averages (1886 = 100).

TABLE 16.—*Index numbers, Oldham, 1833-1906.*

1833	61½	1870	90½	1891	107
'36	67½	'74	97½	'96	110½
'40-41	66½	'77	101½	1900	116½
'50	64	'80	97½	'06	122
'60	79	'83	102½		
'66	86	'86	100		

(To be continued.)

II.—Occupations in England and Wales, 1881 and 1901.

By THOMAS A. WELTON.

ONE of the most important uses of a census must always be to obtain a knowledge of the tendencies towards increase or decrease of the largest classes of workers, and of the proportions at each age of persons not occupied in any industry.

In the following tables I have done my best to bring the details of the census of 1881 into line with those of the latest census, the latter being in my opinion better arranged than the former. There are two points of difference which prevent us from arriving at absolute accuracy of comparison. In 1901 the female relatives of farmers who were actually engaged on farm work were returned, numbering 18,618; but in 1881 these fell into the "unoccupied" class. Then in 1881 certain students were returned as members of the professional classes, viz., theological student, 2,925; law student, 1,653; medical student, assistant, 5,992; art student, 1,337, and agricultural student, pupil, 728, all males. In 1901 students were reckoned amongst the "unoccupied." There are two other cases where the total of persons "occupied" would be unaffected, but the distribution under classes cannot be made to correspond. First, that of railway labourers. These in 1901 were subdivided into

Employed by contractors.... 41,645 | Employed by railway companies 29,562
the former being placed under the class of builders, contractors, &c., and the latter with railway servants. In 1881 the total was stated to be 36,850, but it was not subdivided. Secondly, in the case of "undefined workers," the census of 1881 showed "general labourers," 556,876 males, 2,893 females; but in 1901 the numbers were much reduced, viz., 409,773 males, 305 females, considerable numbers being apparently transferred to the building class, viz.:

Builders' labourers	27,436 males	Masons' labourers	23,019 males
Bricklayers' "	97,779 "	Plasterers' "	6,853 "

and the same attention to discriminative details which led to the introduction of these new headings may have led to other deductions from the "indefinite" total.

With these explanations I now submit a short summary of occupations as shown in the respective census tables:—

	Males.		Females.	
	1881.	1901.	1881.	1901.
Professional	446,559	651,543	194,997	321,142
Domestic	271,141	304,195	1,545,302	1,690,722
Commercial—				
Merchants, agents, accountants, } clerks	277,000	444,623	8,138	58,290
Dealers in money	16,570	31,049	89	279
Insurance service	14,821	55,013	247	1,375
Conveyance on railways	160,757	322,349	648	1,441
" roads	206,673	430,465	1,422	1,186
" seas, rivers, &c.	140,461	131,429	880	842
In docks, harbours, lighthouses	42,573	100,141	70	8
In storage, portage and messages	178,345	235,054	8,017	15,348
	1,037,200	1,750,123	19,511	78,769

	Males.		Females.	
	1881.	1901.	1881.	1901.
Agriculture	1,213,725	1,071,040	64,171	38,946
Fishing	29,402	23,725	294	166
Industrial—				
Miners, quarrymen, dealers	520,408	800,179	7,297	5,006
Metals, machines, makers, } dealers	638,585	929,681	28,907	48,495
Tools	39,631	42,892	8,925	11,013
Ships and boats	53,967	86,524	113	113
Vehicles	62,861	115,083	447	3,395
Precious metals, watches, &c.	67,624	130,731	9,696	18,707
Building, construction, } furniture, wood	849,948	1,079,132	19,671	25,294
Brick, cement, pottery and } glass	103,888	142,365	24,274	33,148
Chemicals, oil, soap, resin, &c.	65,031	106,299	9,256	28,428
Skins, bone, leather, hair, &c.	68,423	81,768	15,864	25,645
Paper, prints, &c.	116,320	188,057	41,711	90,900
Textile, fabrics, dealers	482,094	492,175	612,542	663,222
Dress	346,330	414,637	598,968	710,961
Food, drink, tobacco	420,603	609,720	81,893	174,490
Board, lodging, &c.	93,472	164,571	52,699	125,028
Gas, water, electricity services	25,245	71,284	194	141
	3,954,430	5,455,098	1,512,457	1,963,986
Other general and undefined occupations—				
Sundry industries and trades	36,100	35,704	4,383	5,195
General shopkeepers, &c.	29,088	23,539	25,772	28,037
Costermongers, &c.	29,451	46,941	17,660	14,398
Contractors, &c., undefined	9,898	6,646	579	594
General labourers	556,876	409,773	2,893	305
" building } trades (1901)	—	155,087	—	—
Engine driver, stoker, &c., } undefined	66,137	106,320	—	—
Artisan, &c., undefined	32,602	17,330	3,014	899
Factory labourer, undefined	16,907	23,663	4,238	9,149
Machinists, &c., undefined...	4,645	5,012	7,524	825
Railway labourer (unde- } fined in 1881	36,850	71,207	—	—
	818,554	901,252	66,063	59,402
Without specified occupation or unoccupied—				
Students	12,635	—	1,123	—
Agricultural female relatives	—	—	—	18,618
Sundry, aged 10 years and } upwards	1,530,020	1,977,283	6,588,595	9,017,834
Under 10 years.....	3,326,236	3,591,354	3,312,024	3,609,645
	4,868,891	5,571,637	9,931,742	12,646,097
Grand totals.....	12,639,902	15,728,613	13,334,537	16,799,230

It will appear on inspection that the only class in which was an absolute decrease (setting aside fishing, where many accidents might affect the figures) was that of agriculturists. If we include with the industrial the undefined occupations, there is still a large ratio of increase, notably amongst miners and metal workers.

The "unoccupied" males were fewer in proportion in 1901 than in 1881. This is caused by the relative decrease in numbers of children under 10 years of age. Excluding these, the proportion unoccupied did not vary much, rising from 12·2 to 12·6 per cent.

The proportion of "unoccupied" females over 10 years of age rose from 49·4 to 53·8 per cent. This increase may be due to causes not unfavourable to the public welfare.

The following table shows that very few male inhabitants were returned at either census as "unoccupied" at the ages 20—45. The practice has been to classify men under their principal occupation, no matter whether they were at work at the date of the census or laid aside in hospital, asylum, workhouse or prison, or at home :—

Per cent. "unoccupied" at age	Males.		Females.	
	1881.	1901.	1881.	1901.
0—15	93·2	93·1	95·6	96·2
15—20	10·1	8·2	32·0	34·5
20—25	3·4	2·6	41·1	44·0
25—45	2·0	1·9	71·0	73·1
45—65	5·0	6·7	73·9	78·8
65 and upwards	26·7	39·4	81·7	86·8

It will be noticed that at the age 20—25 the proportion of females unemployed has not increased. The ratios given include the "students" in 1881 and the female relatives of farmers in 1901, so that they are strictly comparable.

This investigation, I may say, was suggested by some conclusions of Mr. W. Rose Smith in his work on *The Growth of Nations*. In this work he states that in the twenty years 1881—1901 there was an extraordinary increase in the numbers of persons returned as "unoccupied." He also sets forth that the industrial class (which he understands as comprehending all workers not included in the professional, domestic, commercial and agricultural classes) had sustained an actual decrease. But, as will appear from the foregoing particulars, both these conclusions are erroneous, and result from an inaccurate classification of the several headings as in 1901. The brief and incomplete manner in which the gross figures are shown puts it out of my power to say what mistakes have affected his calculations.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Il Sesso dal punto di vista statistico*. Part I. *Le leggi della produzione dei Sessi*. Corrado Gini. xxix+517 pp., 8vo. Milan: Remo Sandron, 1908. Price 8 lire.

Population du globe terrestre et sa repartition par sexes. Par S. Goulitchambaroff. MS., 33 pp., 4to. 1909.

Über das Verhältnis der Geschlechter in Indien. Von Robert Kirchhoff. iv + 118 pp., 8vo. Munich: Ernst Reinhardt, 1909. Price 5 marks.

Sex, according to modern inquirers, is "the central problem of life," and it is undoubtedly one of the most fertile in hypotheses, and still far from solution. Its bibliography ranges from China to the later Sanskrit writers, from Aristotle to Avicenna, and in a continuous flow to our own day. None of the more important questions involved in it has been adequately answered; none of the theories put forward regarding it has been generally accepted by modern science. Nevertheless, age cannot wither nor custom stale their infinite variety. Up to a comparatively recent period, numerical observations, not all of them worthy, perhaps, of the name of statistics, formed the principal, or, at all events, a prominent

feature in the respective theories ; but within the last generation the great advance in the use of the microscope in biology has given that instrument precedence over the arithmometer. It is, however, one of the merits of the work of Dr. Gini, that whilst distinguishing the province of biology from that of statistics in the investigation of the origin and the determining factors of sex, he puts clearly before his readers the necessity of co-ordinating the results of the two methods, the qualitative results of the study of the extremely minute with the quantitative test found in the analysis of the large aggregate. The highly specialised character of a great deal of modern inquiry is apt to tend to the restriction of the view to the narrow path of individual effort, without suggesting an occasional survey of the progress of those bound for the same destination by different routes.

Thus, in the volume under review, which is the first part of the expansion of Dr. Gini's Prize Essay at the University of Bologna, the numerical *data* available regarding sex at birth are first treated exhaustively as statistics, and subsequently interpreted in the light of biological investigation. The latter, as is now usually the case, is not restricted to *homo sapiens*, but extends to the lower animals and to vegetable life. (It may be here noted in passing that the author puts in the usual application for more columns in the poor census schedule.) Dr. Gini disposes very summarily of the earlier statements, mostly based upon inadequate figures, that female births are in excess of those of the other sex, and easily proves from the large field of returns which he quotes that not only is the contrary the fact, but that the tendency to variation in the proportion of the sexes at birth is comparatively slight. In demonstrating this, as in other parts of his work, he makes good use of the methods expounded by Edgeworth, Yule, Lexis and other authorities upon probabilities and correlation. A short discussion is thrown in as to the social results of the excess of females consequent upon the difference in the mortality of the sexes—Wellerism, Suffragitis, monogamy and the like—with the conclusion that though the balance of the sexes at the marriage-ages may indicate that monogamy is the matrimonial system best suited to the demographical conditions of the human race, it does not follow that those conditions are the best suited to monogamy. He has thus no use for the teleological optimism which regards the disproportion of the sexes at birth as providentially intended to secure equilibrium in the later twenties.

The subject is then followed through the investigations made in the animal and vegetable kingdoms, with a discussion of the influence of environment, regulations as to intermarriage, natural selection and heredity. The standard authorities on each are duly reviewed, compared, and wherever possible, subjected to the test of statistics and the calculus of probabilities. Few seem to survive the ordeal intact, though most are skimmed of fruitful and suggestive indications. In the last chapter of this, the general survey of sex in its statistical aspect, the author summarises the evidence, historical and other, for the conclusion that sex as an element in life develops inversely with ease and absence of need for exertion, and directly

with physical exertion or the activity of the organism. It is only to be expected that he should conclude with an interpretation of a series of biological deductions which yields a new theory of sexuality. The detailed evidence in support of this is promised in the second volume of his treatise; and the whole should form a valuable, as it is an interesting, contribution to the study of an important and abstruse subject.

The two other works mentioned above are of a more strictly statistical character, and do not enter further into the question of sex than the relative proportions of males and females existing in different parts of the world. The pamphlet of M. S. Goulichambaroff consists mainly of the tables on which he is founding a more elaborate work, not yet published, on sex proportions in various countries. The discovery and subsequent scrutiny, of what is superficially so simple a fact, is in practice, a matter of considerable difficulty, as shown by the labours of Messrs. Levasseur and Bodio in this direction, as well as by the lengthy footnotes and appended cautionary paragraphs which accompany the standard German publications on population. In the present case M. Goulichambaroff gives his authority for each set of figures, but in many cases it fails to carry conviction to those who have trod this thorny path already. The tables are subdivided into three main groups: first, populations which have been enumerated and show an excess of females over males; second, those which, similarly ascertained, show the reverse; and, finally, the estimated population of countries where no census has yet been taken. Taking the total population, known and surmised, as 1,700 millions, the author finds that in 32 per cent. of the whole, grouped, of course, by political divisions, the females are 1,036 per 1,000 males; whilst in 29 per cent. they are only 941 per 1,000; in the remaining 39 per cent. the proportion is unknown. The first remark that suggests itself about these proportions is that the far greater divergence in the second group from parity in number of the sexes justifies the inference that the returns are inaccurate. Closer examination tends to confirm this view. Setting aside the countries where the deficiency of females may be ascribed to the greater immigration of males, it seems that the proportion of women in the return decreases as the position of that sex is lower, or where social custom prescribes reticence in regard to it. This is the case in all Muslim countries, and in those taking their standard in this respect from Islam. As a set-off, wherever the ruling authorities may be assumed to have a substantial interest in the number of adult males, whether for taxation or as food for powder, the proportion of the fair sex is remarkably high. Elsewhere, the enumeration has probably been restricted to a small area or section of the population, and cannot be taken as typical of the whole. The normal tendency of a population whether towards numerical equality of the sexes, as suggested by Von Mayr, or towards a slight superiority of women, a view more generally held, can only be determined by observations extended over a long period, and after elimination of such factors as that of migration, by which some of our best records have been disturbed of late years.

In many cases, an increase in the proportion of women is only the result of a more accurate enumeration. In others, one of which is mentioned below, it represents a real deficiency of males, usually of a temporary character only, and consequent upon famine or war. It will be very interesting to see the results of the more minute examination of the figures which M. Goulichambaroff has in hand, as in such an investigation it is essential to proceed by small territorial subdivision, the recompilation of which sometimes produces results remarkably different from those yielded by the aggregate alone.

The detailed scrutiny of the returns in the light of not only geographical, but of racial and religious subdivision, is carried out thoroughly by Dr. Kirchhoff in his monograph upon the distribution by sex of the population of India in 1901. In this case, there have to be taken into account considerable differences in climate and diet, as well as in race, marriage-custom and migration of the male population. All these were discussed by Mr. Gait in his report upon that census, and they are now handled still more minutely in the volume under review. Much of the deficiency of women is attributed by all to defective enumeration, due to the concealment of girls, deliberately at certain ages and in certain classes, and from mere indifference in others. Then, again, the greater longevity of women is by no means so marked in India as in the West, whilst there is a good deal of loss between the ages of 13 and 25, in child-birth, over and above the normal risk in temperate climates. The practice of female infanticide, though now much diminished, is still extant in certain communities, and neglect of girls, owing to the expense attending their marriage, is lamentably prevalent wherever the marriage regulations are very strict. On the other side of the question there is the rise in the proportion of women to men which characterised the last census. To a great extent this was undoubtedly due to the superior vitality of the former sex during the stress of famine. Apart from this factor, it appears that the proportion has always been shown to be higher amongst the lower castes and tribes than in the upper grades of society, in which immature marriage and inducements to concealment are more prominent. It will be interesting to see how far the next census will bear out the deductions from the last, as the conditions are nearer normal than they were in 1901.

J.A.B.

2.—*Primer of statistics.* By W. Palin Elderton and Ethel M. Elderton. viii + 86 pp. Crown 8vo. London: Adam and Charles Black, 1909. Price, 1s. 6d. net.

A primer of statistics discussing in non-technical language the principal terms and ideas of statistical science has long been a desideratum. The present work goes a long way towards satisfying this need. The headings of the six chapters are technical enough, namely: I. Variates and Medians; II. Quartiles and Means; III. Frequency Distributions; IV. Mode, Standard Deviation, Coefficient of Variation; V. Correlation; and VI. Probable Errors; but the authors have succeeded, with the help of a few homely

illustrations, in making the meaning of these various terms and much of their significance clear to any careful and intelligent reader. It is made perfectly plain that very diverse groups of facts may be statistically described by "curves of error," although the authors leave undiscussed the natural question whether and, if so, why such curves can be expected to arise on *a priori* grounds. Since the book has been written with the purpose, as expressed in the preface by Sir Francis Galton, "of familiarising educated persons with the most recent developments of the new school of statistics," by explaining the technical terms and elementary ideas of that school, it is, perhaps, hardly fair to suggest that the book barely goes far enough in its treatment of the practical side of statistics. For instance, in dealing with correlation, the method "which would be employed in practical work" is not described, but the reader is referred elsewhere for a knowledge of it. The methods actually described in the book, especially the graphic method, while serving the authors' purpose of explaining the idea of correlation, are rather crude, and may yield very inexact results, so that we think reference could have been usefully made to the formula $r = \Sigma xy / \sigma_1 \sigma_2 n$ and its use exemplified without entering into the mathematics of the coefficient. We advance this criticism, however, not to disparage what is actually a useful introduction to statistics, but rather to indicate that there still remains room for an elementary book which shall go farther than the present one without engaging in the mathematical complications of the science.

A.D.W.

3.—*Éléments de la théorie des probabilités*. Par Émile Borel. vii + 191 pp., 8vo. Paris: Librairie Scientifique A. Hermann et Fils, 1909. Price 6 fr.

M. Borel's new treatise on the mathematical theory of probability possesses all the elegance and lucidity which one expects from a French mathematician of his eminence. His admirably enlightened account of the accepted analysis of the subject does not, however, pursue any very novel line of thought. It would have been interesting to learn what comments a first-rate mathematician, coming to the subject without prejudice, would find to make on the logical pre-suppositions of the current theory; but M. Borel only displays his knowledge of the preliminary difficulties, which lie thinly concealed beneath an indisputable superstructure of mathematics, by his skill in avoiding them. A foreign criticism also of Professor Karl Pearson's mathematical investigations in probability and the theory of error would have been very valuable at the present time, and well within M. Borel's own province; but he contents himself by mentioning, in passing, their existence. He pursues, in fact, the orthodox French lines, lines which have been worked over and over again, and where one can no longer expect in the latest writer anything beyond a little more elegance and a little more lucidity than in his predecessor. It must be sufficient to say that M. Borel is sounder than M. Poincaré, but not so solid as M. Bertrand.

The most interesting part of the volume is Book II., in which

what is usually known as the theory of geometrical probability is discussed at some length. Here, however, as elsewhere, the author is inclined rather to avoid than to solve the difficulties, and to avail himself with disappointing readiness of the mathematician's right not to discuss the truth of his assumptions. Apart from this, the completeness of the mathematical discussion is somewhat marred by the absence even of an allusion to Czuber's method of *Mittelwerte*, of which the present writer would have been glad to have seen an independent discussion.

M. Borel's treatise can be strongly recommended to readers who wish to obtain an outline account, of a moderately advanced character, dealing with the accepted analysis of mathematical probability. But those who are already well acquainted with the literature of the subject, will not find in it very much that is new to them.

J.M.K.

4.—*The nation's income. An outline of national and local taxation.* By F. W. Raffety and W. H. Cartwright Sharp, M.A., LL.B., Barristers-at-Law. 123 pp., 8vo. London: Thomas Murby and Co., 1909.

Few people who have not devoted considerable trouble to the subject could give an adequate account of the methods of national and local finance, and of the collection and appropriation of revenue; and this unpretentious little book will be of considerable use to the non-expert who likes to have complicated matters explained in simple language. An outline statement is given of the method of parliamentary control of taxation, which is followed by a brief but sound discussion of the principles of taxation, and a full detailed account of the taxes in force and the amounts received in 1907-08. The proverbial rashness of prophecy is illustrated by the sentence: "It is therefore unlikely that such a Bill [as the Finance Bill] will ever be rejected [by the Lords]." The history and treatment of the National Debt is clearly expounded; but we could have wished that the section on local taxation had been fuller, especially as to the relation between central and local accounts and to the statistics of the latter. The final chapter on revenue and protective taxes was, we suppose, necessary in the scheme of the book, but it is slight, and therefore inconclusive.

We hope that the book will reach a second edition, and that opportunity will be taken of correcting inaccuracies. The deduction of a life insurance premium before income-tax is paid is not unrestricted (p. 44), nor is the choice of paying tax on the results of the current year instead of on the average of the previous three open except in special circumstances (p. 49); a great part of income-tax under Schedule E is not collected at the source (p. 49). It is quite doubtful whether so much as 8 per cent. of the total income which should be subject to tax evades it ultimately in these days of strict assessment (p. 46). It is strange to include the whole cost of maintenance of the post office in the cost of collecting revenue; it would have been more interesting to show the remarkable cheapness of the collection.

A.L.B.

5.—*Die Übervölkerung Deutschlands und ihre Bekämpfung.* Von Dr. Ferdinand Goldstein. 128 pp., 8vo. München: Ernst Reinhardt, 1909.

The problem of over-population in a limited sense is an eminently practical one, and any proposals for solving it are of interest. Dr. Goldstein enters on his treatment of the over-population of Germany by impugning the Malthusian doctrine of the dependence of the number of the population on food supply. He substitutes for it the proposition that the size or density of the population is determined by the amount of work to be done, or in other words by the demand for labour. Taking things as they are there is a great deal to be said for the view that "whoever has work can procure the means of life," though this does not appear to us to falsify the position of Malthus. Proceeding, the author supposes general over-population to be practically impossible, although partial over-population may and does occur. Particular industries can give employment to only a limited number of persons. Agriculture is one of these industries. Hence there arises in rural Germany (and elsewhere) an over-population, which is termed "social over-population," that is, an excess in the supply of a particular kind of labour over the demand for it. The excess must either emigrate to other countries or to towns, the numerous industries of which may be, and in Germany are, able to absorb a never-ending supply of labour. It is to this "social over-population" of the rural areas, and not to the amusements or other attractions of town life, that Dr. Goldstein ascribes the rural exodus, an incidental consequence of which is asserted to be the growth of social democracy. There may be also over-population in the towns, as shown by excessive supply of labour in particular industries, and by overcrowded dwellings, which give rise to high rents, great infantile mortality, and other evils.

There is, however, a general cause at work tending, in the author's view, unduly to increase the population of Germany, and especially to increase the least desirable classes of it. This cause is the legal prohibition of artificial abortion, to the discussion of which Dr. Goldstein devotes much of his book. We doubt whether Dr. Goldstein, in recommending the abrogation or modification of the laws in question, has fully estimated the grave dangers attaching to the freedom he advocates. He does not believe, however, that such a change in the law will of itself raise to a higher level "the deeply-sunk population of Germany." Something more positive is required, and the author's final suggestion is the formation by the middle classes, in whom alone reside the necessary qualities, of co-operative undertakings or establishments on a dual basis of agriculture and industry, the latter absorbing the labour not required by the former, and so stopping the flow to the towns.

The book is interestingly written, and contains many suggestive ideas, though there is much in it, as already indicated, with which we cannot agree.

A.D.W.

6.—*Stock Exchange investments in theory and practice, with chapters on the constitution and operations of the Bank of England and the National and local debts of the United Kingdom.* A course of lectures by Joseph Burn, F.I.A. Delivered at the Institute of Actuaries, Staple Inn Hall, during the Session 1908-09. vii + 322 pp., 8vo. London: C. and E. Layton, 1909.

This book has a double value. It will not only interest the general reader, but it will be eminently useful as a text-book in higher commercial education. It was, in fact, specially written with that object, and was originally cast in the form of lectures to a class of actuary students. The Institute of Actuaries not only arranged for the lectures, but have published them officially on their own account. Such an act of well-directed enterprise on the part of a professional body is in the highest degree commendable. All the more so that it has not only been well planned, but well carried out. The Institute of Actuaries, like the Accountants, the Secretaries, the Surveyors, and other professional guilds, are taking great pains to raise the qualifications of their members to the highest possible level. With that object they have organised educational tests of a very severe and searching character. They are not content with holding examinations and granting certificates; they provide special training classes adapted to their syllabus. They provide, in fact, a complete scheme of actuarial education, and if all parts of it are as efficient as the Stock Exchange branch of it appears to be it must be turning out capable men. The Stock Exchange itself might take a hint from the Institute of Actuaries, and provide a similar course of training for its clerks and junior members. This is certainly the best and most efficient kind of business education now available in the City. Commercial colleges, schools of economics, and evening classes are all very well up to a certain point, but when one is qualifying for a technical profession the closer one can get to the real work of it the better. The Institute of Actuaries combine theory and practice, and Mr. Burn's lectures on Stock Exchange investments are a good example of the combination. They explain both the underlying principles and the technical details of modern investment as practised in this country, and chiefly, of course, in London. A considerable part of the book is, no doubt, familiar ground—for example, the first three lectures on the Bank of England. But when he comes to the national debt Mr. Burn makes a decided advance on any previous writer. He enters thoroughly into the subject, as if he enjoyed describing its peculiarities. "Privy Seals," tallies, tontines, lottery loans, and the old sinking funds are favourite topics with him. But it is in his account of the life annuities that he is seen at his best. As an actuary, he knows all about how they were calculated, and can point out the many mistakes made by their authors. On this point he speaks as a specialist—but a lucid and intelligible specialist. His sketch of the various conversions, from Goulbourn's down to Lord Goschen's, is exactly what intelligent students might be expected to appreciate. While precise in all its statements and figures, it is at the same time readable. Equally good is his minute account of Stock Exchange

transactions. He gives them all in adequate detail, and illustrates them with facsimiles of contract notes and the various other documents in daily use. Actuary students may well be grateful to Mr. Burn for this admirable text-book. W.R.L.

7.—*A Project of Empire*. By J. Shield Nicholson. xxv + 284 pp., 8vo. London: Macmillan and Co., 1909. Price 7s. 6d.

This informing and suggestive book may not inappropriately be described as a direct outcome of the fiscal controversy; and, whatever be their own personal opinions about the *pros* and *cons* of that vexed question, all students of economics, who can appreciate lucid, forcible and attractive exposition, will, we feel sure, unite with us in a feeling of genuine gratitude to the cause which has been responsible for producing this particular effect. It is possible, however, and indeed it is probable, that the author will not win the entire assent of avowed partisans of either side of the present debate.

The "convinced" tariff reformer may perhaps regret that Professor Nicholson, having moved so far along a road which he himself has travelled, has not, for the moment at least, made a further advance. For, while the argument presented in these chapters frankly recognises the great possibilities of a fiscal policy of preference, regarded from the point of view of the Colonies, as a step towards Imperial Free Trade, the writer seems still averse from, or at any rate suspicious of, the complementary action involved in some modification by the mother country of principles embodied in customs arrangements introduced and consummated half a century ago. They were then, it must be remembered, a new departure rather than an extension of a traditional system.

And yet, on the other hand, benefiting by subsequent speculative inquiry and later practical experience, Professor Nicholson has discerned even more fully, and presented even more clearly and conclusively, than the old economist, whose shrewd sagacity and remarkable breadth of view he has taken such pains to commend in these pages to the favour of politicians and philosophers to-day, the extravagances and defects which impair the logical validity and limit the actual pertinence of the case for free trade as it has been popularly stated, and lightly accepted. For this reason the volume may, we think, serve as a landmark in the history of the discussion on which we are now engaged. It is unquestionably a book which is calculated to make those who consult it think; and we have mistaken the aim, and misinterpreted the temper, of its author, if their thought is not likely to be that which befits a candid mind. It should assuredly be the product of careful independent judgment, avoiding the distorting influence alike of the plausible catchwords of the passing moment, and of unreasoning or ingrained prejudice.

But Professor Nicholson has had a dual purpose in his essay. He states in his Preface that his work "may be considered on one side as a critical study of the *Wealth of Nations*, whilst on the other it deals with present problems." In fact, he adds to the short title

of the book the explanatory description that it is a "critical study of the Economies of Imperialism, with special reference to the ideas of Adam Smith." On this further ground also he has, we think, earned the heartfelt thanks of economic students. For he has recalled to their notice, and made them reconsider, the latent meaning of many significant passages of that treatise which above all others deserves, and has earned, the repute of being an economic "classic;" and the sincere enthusiasm by which his reverent and affectionate treatment of an "old master" has been characterised supplies a pattern which most commentators on ancient texts might follow with advantage to themselves and to their fellow-students. He lets his author, indeed, speak for the most part for himself, but he is punctiliously painstaking in bringing out into prominence the real Adam Smith and in displaying the whole scope and purport of his argument. He is rightly jealous for his essential consistency; and he lays just stress on that comprehensiveness of view which can find no more than inadequate expression in isolated sentences or short quotations. He is anxious to demonstrate the large humanity and sound instinct of the father of modern Political Economy; and to render ample recognition to all his best characteristics.

If Professor Nicholson errs at all, it is by dealing more rather than offering less than justice to his subject. For we are not sure that sufficient account is taken of the undoubted fact that Adam Smith was in some notable respects a biassed advocate, stating a case with an unusual command of the persuasive force and expert skill of a confident and able pleader. Nor, if it be true that he was accustomed to compose by the method of dictation, is it impossible or unlikely that he should sometimes fail to be entirely consistent. Nor, with all the "nationalism" which Professor Nicholson is right in thrusting on the notice of forgetful or unobservant critics as a leading trait of Adam Smith, is it otherwise than probable that he should have been sensitive to the "cosmopolitanism" which was in the air of educated thought at the time when he lived and wrote.

That Adam Smith's abundant stock of "saving" common-sense preserved him from excesses or mistakes of which his followers might be guilty is a matter on which we entertain no doubt; and Professor Nicholson's careful collocation of passages from his writings must surely heighten the admiration felt by all who have read with attention the first of modern economic treatises for the same discernment of its author. Again and again, as we follow Professor Nicholson through the successive stages of his apt and lucid presentation of the salient arguments on free trade and protection, we are impressed by the mingled skill and felicity with which Adam Smith has seen and has stated points which his successors have neglected; and the chief recollection we shall carry away from this opportune and stimulating essay is a vivid sense of the actual "modernity," if we may use the phrase, of language employed not much less than a century and a-half ago.

The qualifications of free trade theory which Adam Smith suggested have, it is obvious, their special pertinence to contemporary debate; and there are few, if there are any, authors who could, we imagine, stand so well the test of so considerable a lapse of

intervening time. The distinction, for instance, which he draws between the profit of the individual trader and the advantage of the nation as a whole, and the superiority belonging to the employment of capital at home as compared with its use in the foreign or the carrying trade, are among the considerations noted in the *Wealth of Nations* which Professor Nicholson brings into needed prominence; and, similarly, he shows that the exceptions which Adam Smith himself made to the general rule of freedom of trade were not only significant at the time when they were originally put forward, but admit of large extension as applied to the circumstances of the present day.

In these and other ways he has contrived to kindle a new and lively interest in an economic classic, while he compels all honest fiscal controversialists to scrutinise more closely than heretofore the argumentative weapons which they employ. L.L.P.

8.—*Histoire des doctrines économiques depuis les physiocrates jusqu'à nos jours.* Par Charles Gide et Charles Rist. xv + 766 pp., 8vo. Paris: Larose et Tenin, 1909. 12 frs.

Historical circumstances are not sufficient, our authors say in their preface, to explain by themselves the origin of theories. How, they ask, could we explain on that hypothesis the antagonistic theories of contemporaries like Say and Sismondi, Bastiat and Proudhon, Schulze-Delitsch and Marx, Walker and Henry George? An answer to this question might perhaps be found, but it is more difficult to reply when the further question is asked: "And to what historical circumstances could we attribute Cournot's introduction of the mathematical method in France or the simultaneous discovery in three or four different countries of the doctrine of final utility?" But there is really no need for MM. Gide and Rist to contend that the history of economic doctrines is a branch of science distinct from economic history; however close the connection between the two may be, a great deal of matter can be usefully divided between them. We have outlived the view of J. B. Say that nothing is to be got from a study of the erroneous ideas of our predecessors.

The work is divided into five books. Book I deals with the founders of modern economics, the Physiocrats, Adam Smith, and "the pessimists," as M. Gide calls Malthus and Ricardo. Both of them would have disclaimed the name. Malthus, at least from 1802 onwards, was distinctly a social reformer, preaching the desirability of a particular course of action, and opposing measures which in his opinion deterred people from following it. Ricardo followed Malthus unhesitatingly so far as the prospects of the working classes were concerned, and was in addition an ardent advocate of reforms which he expected to increase or maintain profits. Nevertheless the general effect of their teaching was no doubt so dampening that perhaps the epithet is justified, though the economist of to-day, who does not feel pessimistic at all, must feel some anxiety lest he too should come under the same condemnation in the work of some twenty-first century M. Gide.

Book II gives us a sketch of the heretics—"Les Adversaires"—of whom the chief are Sismondi, Saint-Simon, Proudhon, and List. This will be useful to those who have a fair acquaintance with the principal orthodox writers and have been too lazy or too occupied to give time to their contemporary critics, whose opposition had more effect than the orthodox were inclined to admit. M. Rist attributes to Sismondi the first use of the term "orthodoxy" as applied to the doctrines of the economists of the prevailing school.

In Book III, headed "Le Libéralisme," M. Gide deals with "the optimists," Bastiat and Carey, and "the zenith and decline of the classical school." At the present day students of the history of economic theory are often puzzled to account for the discredit into which the body of doctrine which was built up in the half-century following the publication of the *Wealth of Nations*, and was put into a plausible form in J. S. Mill's *Principles* some years later, fell in the last quarter of the nineteenth century. "Where," they ask, "are we to look for the criticism which destroyed belief in the theories which had such strong hold on the instructed minds of the middle of the century?" The question should be answered by Book IV, "Les Dissidents," in which M. Rist writes of "the historical school and the quarrel about methods," and also of "State Socialism," while M. Gide deals with Marxism and Christian Socialism. The fact is, however, that the decline of the old body of doctrine was due to atrophy rather than to attacks from outside. With the reform of the poor-law and the introduction of free-trade it had done its work so far as the United Kingdom was concerned, and it was too much interwoven with distinctively English conditions ever to obtain really wide acceptance abroad.

Book V deals with "Recent Doctrines," always the most difficult task in a work of this kind. M. Gide treats of the Hedonists and the Solidarists, M. Rist of the theory of rent and the anarchists. M. Rist points out that it was the elder, not the younger Mill, who originated the proposal for the taxation or confiscation of all increment of land value over its present amount. In his *Elements* (1821), ch. IV, sect. 5, James Mill says: "It is certain that as population increases, and as capital is applied with less and less productive power to the land, a greater and a greater share of the whole of the net produce of the country accrues as rent, while the profits of stock proportionally decrease. This continual increase, arising from the circumstances of the community, and from nothing in which the landholders themselves have any peculiar share, does seem a fund no less peculiarly fitted for appropriation to the purposes of the State than the whole of the rent in a country where land had never been appropriated." It is only necessary, he thinks, that the "original rent of the landholder, that upon which all his arrangements . . . must be framed," should be secured to him, with perhaps a little addition for "some very moderate prospect of improvement."

MM. Gide and Rist have produced a very excellent work. They have read their authors well, and adopted sane and unbiassed views concerning them. They have also succeeded in what is perhaps a

more difficult task, and one in which Frenchmen alone are likely to succeed—the task of making the true history of economic theory readable. E.C.

9.—*Royal Commission on the poor laws and relief of distress.* Appendix, vol. xii. *Memoranda by individual Commissioners on various subjects.* iv + 461 pp., fol. [Cd—4983.] 1910. Price 5s. 7d.

This volume contains a series of treatises, modestly described as “Memoranda,” by four experts, mainly dealing with historical developments of the great problem submitted to the Commission from the respective points of view of the writers. Dr. C. S. Loch compresses the period from 1601 to 1834 into a brief essay. He states succinctly the leading provisions of the Act of Queen Elizabeth, which was passed for a limited period, continued by subsequent Acts, and finally made perpetual in 1640, and then traces the development of thought and method which took place in relation to its administration. The Act was only adopted gradually by the local authorities. Its leading idea was to secure social peace by the law of compellability to labour, or by setting the able to work and to provide necessary relief for the aged or impotent poor unable to work. The control of the administration of the Act was with the justices, but by 1722 their rule had become lax, and it was necessary to legislate for the prevention of false and frivolous claims to relief. Thus the workhouse system was developed: but it gave rise to great dissatisfaction, and to a reaction in favour of outdoor relief. Finally, under Gilbert's Act, the system of a single workhouse for a union of parishes under a board of guardians was created, and from these workhouses the able bodied were excluded. This movement of opinion shows that the problems of the poor law in its earlier developments are much the same with those we have now to face.

Professor Smart's treatise takes up the history at the point where Dr. Loch had left it, and consists of five memoranda, dealing respectively with the report of the Commission of 1832, the principles of the Act of 1834, the work of the Poor Law Commissioners during the thirteen years next following, the subsequent operations of the Poor Law Board during twenty-four years, and the first six years of the Local Government Board, when the crusade against outrelief was prosecuted. The famous report, which declared the administration of the poor law to be “destructive to the morals of the most numerous class and to the welfare of all” is fully and clearly abstracted. The statute of 1834, which was consequential upon that report, is next examined, with the view of ascertaining what its principles are, a point upon which the Act itself does not give much information. It gave to the Poor Law Commissioners created under it the direction and control of the administration of relief to the poor. Of the real authors of the Report, one, Mr. Senior, had been employed to draft the bill, and the other, Mr. Chadwick, became the Secretary to the Commissioners. It is, therefore, in the annual reports of those commissioners that Professor Smart seeks his definition of the principles of the Act.

The first and most essential one is there stated to be to let the labourer find that the parish is the hardest taskmaster and the worst paymaster, and thus induce him to make application to the parish his last and not his first resource. Professor Smart gives full details of their successive reports, ending with that of 1847, when the Commission was dissolved, and the Poor Law Board, a body represented in Parliament, took its place. He does not attribute the transfer of the central authority to any national change of opinion as to these principles. In his analysis of the reforms which that Board effected during its tenure of office, he shows that they were in conformity with those principles. In 1871, its functions were transferred to the Local Government Board. Strict revision of outdoor relief became the note of their policy for some years, and they issued a series of recommendations to the guardians with the view of inducing them to adopt sound principles of administration in this respect. It was argued that by this policy a great reduction of expenditure had been effected, but Professor Smart is of opinion that, in the long run, the decrease in the outdoor relief seems to be accompanied by an increase in other forms of assistance. He does not assert that there is a causal connection between the two; but if it be proved that there is such a connection, he holds that it is clear that total expenditure can decrease only until the irreducible minimum of outdoor relief is reached.

Mrs. Sidney Webb's treatise takes a wider scope, and consists of four memoranda, dealing respectively with the policy of the central authority from 1834 to 1897, the medical services of the Poor Law and the Public Health Departments of English local government in their relation to each other, to the public, and to the prevention and cure of disease, the history of Poor Law administration in Bradford, and the history of Poor Law administration in Poplar. The two latter memoranda are compiled under her directions from the MS. records of the respective boards of guardians by Mrs. Spencer, B.S., D.Sc. (Econ.). The whole four occupy 228 folio pages. Like Professor Smart, Mrs. Webb begins with a statement of the main features of the Report made in 1834 of the Commission appointed in 1832, described by her as the "Revolution of 1834." She includes in it the dogmatic assertions of principle contained in that report, as well as its formal recommendations. She also describes the work of the Poor Law Commissioners and the Poor Law Board, covering the same ground with Professor Smart. We can pass on, therefore, to her discussion (1) of the work of the Local Government Board, and (2) of the principles of 1907. In regard to the former, Mrs. Webb acknowledges the assistance rendered to her by Miss Mary Longman in preparing an elaborate preliminary analysis of the whole of the printed documents, and the kindness of Sir Samuel Provis in supplying her with documents not otherwise accessible. The policy developed during the 60 years from 1847 to 1907 is so complicated and diversified as to call for lengthy analysis. She defines the principles of the 1834 Report as those of national uniformity, of less eligibility, and of the workhouse system, and she seeks to show

how by 1907 all those principles had been departed from. That of identity of treatment of each class of destitute persons from one end of the kingdom to the other is now obligatory with regard to one class only of destitute persons, the wayfarers or the vagrants. The doctrine that the condition of the paupers should be less eligible than that of the lowest grade of independent labourer is applied by the Central Authority unreservedly only to the same class. The use of the workhouse as a test of destitution is still the policy of the Central Authority, but only for the same class. On the other hand, new principles, unknown in 1834, have been adopted—the principle of curative treatment, the principle of universal provision, and the principle of compulsion. Mrs. Webb draws between the triad of principles of 1834 and the triad of 1907 the broad distinction that the former embodied the doctrine of *laissez faire*, the latter the doctrine of mutual obligation between the community and the individual. This development, she holds, has been an unconscious one, and has not occupied all the ground. There is a no-man's-land in Poor Law administration, in which the principles of 1834 have been in fact abandoned, but those of 1907 have not been consciously substituted for them. The new principles are not themselves of universal application, and it is for the Commission to determine the lines of demarcation between them and the old principles. Mrs. Webb's own solution of the problem which she states with so much force and clearness is, of course, to be found in the minority report. It may well be, however, that the facts, from another point of view, might be found to support the solution which commended itself to the majority of the Commissioners, and is embodied in their report.

Mrs. Webb's historical survey of the medical service begins with the parish doctor as he existed before 1834, and ends with emphasizing the confusion between his functions and those of the medical officer of health. She describes fully the functions of district medical officers under the poor law in the domiciliary treatment of the sick poor, and the operation of the workhouse and the infirmary in their institutional treatment. With these she compares the medical service of the public health authorities. She estimates the total expenditure out of the rates on the sick in England and Wales at 7,000,000*l.*, to which may be added the expenditure of voluntary agencies and private, club, and dispensary practice. She considers this expenditure largely wasted so far as any advantage to public health is concerned.

The paper on pauperism in Bradford is illustrated by a chart prepared by Mr. F. H. Bentham, Chairman of the Board of the Bradford Union.

The Right Hon. Charles Booth retired from the Commission before its Report was signed, and the treatise contributed by him to the volume consists of a condensation for definite groups of unions of the detailed statistical figures prepared for the use of the Commission, and a preliminary summary of the conclusions arrived at by him as to the case for reform and the changes to be adopted. He urges the necessity of the recognition of distinct

spheres of work for the poor law; for the public health departments; and for voluntary action in matters of sickness. To take things as we find them, he says, "destitution, present or impending, is the basis of poor law action, danger to the community justifies that of the public health authority, and sympathy with suffering inspires all voluntary provisions for the care of the sick." In their outdoor work the spheres of the three systems do overlap a good deal. Having first created a larger area for the poor law boards, so as to reduce their number to 35 or 40, he would welcome any developments of municipal or local action, whether remedial or preventive, in the interests of public health; would leave the appropriate spheres of the same twofold lines of development open to voluntary agencies; and finally, as regards remedial action, trust to the poor law to supply deficiencies, this being the necessary complement to the whole system.

These four masterly treatises show the reasoning upon which the majority and minority reports respectively have been based, and contribute largely to a clear understanding of the many complicated and difficult problems the solution of which the Royal Commission was charged with the duty of finding. E.B.

10.—*How the casual labourer lives. Report of the Liverpool Joint Research Committee on the domestic condition and expenditure of the families of certain Liverpool labourers.* Liverpool Economic and Statistical Society. Liverpool: The Northern Publishing Co. 8vo. 1909. Price 1s.

The aim of this investigation is to elicit the inner or domestic meaning of those conditions known as casual labour, with their concomitants of irregular employment and under-employment which have been set before us by the Poor Law Commission, as well as by private inquiries, and which have been so admirably analysed by Mr. Beveridge in his work, "Unemployment." We all know by this time that dock labour and other kinds of casual labour are characterised by extreme irregularity of earnings; that, for instance, the best man of this class, in the prime of life, may earn 40s. one week, or even more, and not more than 30s., 20s., or 15s. the next, while the inferior or weakly man may vary from 30s. to 4s. 6d. or nothing. This inquiry shows us something of the inevitable reaction on the home of such conditions. It is obvious that the task of the housekeeper is one of extraordinary difficulty in the face of such fluctuations of income, and while a great deal can no doubt be urged in favour of domestic training for girls, such training will not of itself solve the difficulty. Even the wife of a professional man, with all the advantages of better education and trained help, would find it perplexing to adjust her housekeeping to an income which varied in short periods as much as 50 per cent. above or below the mean, and as in such an instance the shortage would never be such as to stint the actual necessary food and fire, it is obvious that this example gives an inadequate idea of the problem before the casual labourer's wife.

The investigators gave special attention to the question of how this difficulty is actually met, and they started with an expectation

of three possible solutions: first, that the surplus of good weeks would be saved to meet bad ones; secondly, that the family would alternate between privation and comparative plenty; thirdly, that the labourer would simply give his wife a minimum and keep the surplus himself. All these expedients were discovered in use, the first very rarely, the other two separately or in combination in many households. But in most cases "the curve of income and expenditure is to some extent smoothed by the help of the pawubroker or moneylender, or both." According to this report, the evils of the pawnshop are comparatively slight, but those of the moneylender much more serious. The moneylender, usually a woman, having in most cases no security for her loans, secures her profit by charging an exorbitant rate of interest, and in some cases refuses to receive payment by instalments, as she thus obtains a continuance of the interest. The generality of these transactions, and the extent to which persons supported by casual labour are driven to such extravagant modes of "retrogressive saving" form the most vivid fact of the book. In one case, No. 5 (p. 10), the keeping of accounts requested by the investigators had the unexpected and beneficial result of enlightening the housewife as to the real meaning of borrowing on such terms, and it is evident that in many cases the women do not realise how dearly they are paying for temporary relief.

The investigators concur with many recent inquirers in believing that casual and irregular labour is the greatest evil under which the working classes are now suffering. It is not merely the physical evils, the privation in slack weeks, and so on; it is the demoralising nature of such employment, and the fact that "character and intelligence . . . do not seem to have the industrial value at the docks that they have in more regular occupations," and are valued lower than "robust health, strong muscles, and a certain good luck or skill in winning foremen's favour." "Everything about the system of employment seems to foster the formation of bad habits and nothing to encourage the formation of good ones." The writers of the Report are in favour of Labour Exchanges, and, if necessary, of some degree of compulsion on employers to make use of them, and they believe that although the existence of an unlimited reserve of labour to draw upon is in some ways a convenience to the employer, the improvement in character and efficiency that would result from regulating the labour market would soon reconcile all parties to the change. They also suggest that a simple method of insurance against unemployment would be arrived at by requiring the employer to pay a percentage of every labourer's earnings into an unemployment benefit fund, to be drawn upon only in weeks when his total employment fell below a certain minimum. This, they consider, might achieve without financial risk the desired "smoothing" of an irregular wage which is now accomplished very extravagantly through the medium of the moneylender and the pawnshop, and thus substitute "saving forwards" for "saving backwards." The latter institutions are suggested as desirable subjects of investigation, though the authors reserve their judgment as to the advisability of establishing *monts de piété*.

B.L.H.

11.—*Syndicats et services publics*. Par Maxime Leroy. xi + 321 pp., sm. 8vo. Paris: Armand Colin, 1909. Price 3 fr. 50 c.

Among the recent developments of Socialism the particular manifestation which has appeared in France under the name of "Syndicalism" is not the least interesting or conspicuous. Its adherents believe in the efficacy of the weapon of the "general strike," and they do not conceal their opinion that socialistic reformers of the type of Bernstein in Germany, or the members of the Fabian Society in England, who repudiate as obsolete the theories of Marxism, and reject as impracticable the policy of a "class war," have strayed from the right path in the illusive pursuit of a creed more akin to compromise and a programme less extreme than those which the aggressive socialists of the last generation adopted and avowed. To the "general strike" the establishment of trade unions is an indispensable preliminary; and in France, accordingly, the "syndicats" formed on the analogy of our workmen's combinations have generally evinced a pronounced tendency to socialistic tenets and acts of the more violent and determined type.

In this little *brochure* the history of trade unionism in France is traced from the nominal toleration, accompanied by a really substantial veto, which was the ostensible attitude of the State in the latter days of the Second Empire, to the attempt made under the Republic to reconcile efficacious combination with liberty of individual action, both by employers and also by those workmen who are not included in the membership of a trade union. Our author shows that the law has tried to bring into accord these conflicting aims; and we gather from his account that its efforts have met with a larger measure of failure than success. In the most recent phase of administrative practice and legislative activity, French statesmen have, it would appear, endeavoured to encourage and develop by various indirect methods the innocuous side of combination, and by this tortuous policy, rather than by any distinct restriction or open prohibition, they have striven to curtail the growing power of trade unions in the industrial world.

But it is impossible to read carefully the narrative presented in this essay without noticing as the most significant circumstance of the history recorded the unquestioned fact that the identity of the workmen's "syndicats" with Socialism has become more obvious and more intimate with the lapse of time; and it is acknowledged that the conspicuous institution of the Bourses du Travail, which we are about to copy in our own Labour Exchanges, forms an active centre of socialistic propaganda. The "Syndicalism," moreover, which proclaims the "class war," has rejected the intervention of the more moderate party of French socialists in the ordinary politics of the day as despicable opportunism seeking an unstable compromise with the existing order of affairs.

As M. Leroy demonstrates this inevitable sequence of events with convincing force in the first two sections of his essay, it will perhaps surprise his English readers to find that in the last two, where he examines the relations of the principles and practice

of combination among employees to the requirements of the public service, he should, if we do not misunderstand him, incline to the opinion that the law is unfairly harsh, when it imposes limitations on the free use by civil functionaries of the pressure that can be exerted on employers by the united strength derived from association in trade unions. The action taken by the Ministry and the attitude adopted by the Chamber in the matter meet with his criticism rather than receive his approval. And yet it would seem to the detached bystander that in the public interest it is necessary to affirm that avowed servants of the State cannot be permitted to push their endeavours to better their position to such lengths that they seriously dislocate, or entirely obstruct, the fulfilment of the imperative needs of the community by which they are employed.

It is true that it may be difficult to establish any precise distinction between public officials and the workmen engaged on some processes of manufacture, or distribution, or transport which are equally indispensable to the satisfaction of the ordinary daily or hourly requirements of the public. It may be admitted that there are trades and occupations where grave inconvenience, and even positive danger, may result to the general public from the hindrance caused, or the friction aroused, by a struggle between employers and employed, organised in their "syndicats." It is possible, or even probable, that the State may before long be induced, or compelled, both in France and in England, to interfere more authoritatively than has hitherto been customary in the compulsory adjustment of industrial disputes. And it is not unlikely that the reasoning used by M. Clémenceau, for instance, in dealing with the *syndicats* among the French officials, might logically be given a wider application.

But a more forcible plea for suspense of judgment than these various contentions is advanced by our author when he maintains that the grievances for which French civil servants now seek redress through the effective mechanism of their syndicats are such as to cause positive injury to the public interest; for they wish for promotion by merit in lieu of political favouritism and unfair jobbery. They want to replace notorious corruption by straightforward purity; and in advancing their own claims to better treatment than that they now receive they are working for and not against the general advantage. They desire a reasonable security of status to be substituted for capricious dismissal; and combination in trade unions, which is permitted to the workers in other occupations, will, as they think, alone furnish this necessary guarantee.

From the account we have given of the main lines of argument followed by M. Leroy in the successive sections of his essay, it will be seen that his clear and forcible statement deserves, and will reward, close, impartial study. L.L.P.

12.—*Other New Publications.**

Bowley (Arthur L.). An elementary manual of statistics. vi + 215 pp., 8vo. London: Macdonald and Evans, 1910. Price 5s. net.

[The first part of this manual deals with elementary methods and with such technical terms as are indispensable in the handling of statistics. The second part is an historical and critical guide to official statistics. There is an appendix of exercises for students of statistics, together with a useful list of selected books of reference.]

Brouilhet (Charles). Le conflit des Doctrines dans l'Economie politique contemporaine. viii + 306 pp., 8vo. Paris: Felix Alcan, 1910. Price 3 fr. 50 c.

[The author divides his work and studies his subject under four heads. The first section is devoted to the evolution of the Liberal school and the problem of inequality of opportunity. In the second part, M. Brouilhet discusses the "school of intervention and social radicalism" in its different stages. The third part deals with the attitude of Socialism towards Society as it is to-day; and the fourth part relates to Trade Unionism in its relation to economic teaching.]

Culpin (E. G.). Practical application of town planning powers. Edited by, 72 pp., 8vo. London: P. S. King and Son, 1909. Price 1s. net.

[This pamphlet is of especial interest now that the first Town Planning Act has been placed on the Statute-book. It contains an analysis of the Act and short papers by different writers on various questions and difficulties that are likely to arise in the working of the Act.]

Galton (Sir Francis), F.R.S. Essays in eugenics. 109 pp., 8vo. London: Eugenics Education Society, 1909. Price 1s. 6d.

[Essays dealing with the possible improvement of the human breed, the definition, scope, and aims of eugenics, restrictions in marriage, eugenics as a factor in religion, and probability as the foundation of eugenics. The essays are reprinted in the order of their delivery, and thus help to show something of the progress of the study during recent years.]

Gibson (A. H.). Bank rate. The Bankers Vade Mecum. 3rd year of publication. 71 pp., 8vo. Leeds: J. W. Bean and Son, 1910. Price 2s. 6d. net.

[It is the author's intention to issue this useful collection of tables yearly. The table giving in chronological order each change in the Bank rate with its duration, rate, and date of change since 1844, is of much value, since complete lists of these changes are not readily available. It would be of increased interest if it were possible for the compiler in a future issue to add in another column the open market rates over the same period, so far as they are obtainable. Mention might also be made of the list of the changes in the Bank rate arranged in descending order from 10 per cent. downwards, and of the causes which led to these high rates. It may be borne in mind that before the passing of the Bank Act of 1844, the Bank rate was purely conventional, and remained unchanged for many years. A 5 per cent. rate fixed in 1746 remained in force until 1822, and there were only twelve changes in the rate between 1822 and September, 1814.]

Hobson (J. A.). The crisis of Liberalism: new issues of democracy. xiv + 284 pp., 8vo. London: P. S. King and Son, 1909. Price 6s. net.

[The express intention of this volume is to determine the relation of the present constitutional struggle to the larger issue of the future of English Liberalism. The book is divided into three parts, under the heads Democracy, Liberalism and Socialism, and Applied Democracy. The removal of the veto of the House of Lords would necessitate a drastic reform of the electoral system. The author adduces the example of the Swiss Referendum as a serviceable complement to representative government.]

* See also "Additions to the Library," pages 204, *sqq.*

Latham (Arthur), M.D., and *Garland (Charles H.)*. The conquest of consumption : An economic study. 185 pp., 8vo. London : T. Fisher Unwin, 1910. Price 4s. 6d.

[The authors, who regard consumption as a direct product of civilisation, divide their work into seven chapters, dealing with the cost in life, our knowledge of the disease and the means of its prevention, the cost in money to friendly societies and other institutions, and the case for State intervention. There are two appendices, the first on the results achieved by working-class societies, and the second on the erection of cheap sanatoria.]

Molesworth (Sir Guilford), K.C.I.E. Economic and fiscal facts and fallacies. xii + 292 pp., 8vo. London : Longmans, 1909. Price 3s. 6d.

[The author's object in publishing this book is to bring together views on economic and fiscal questions and criticism of the "Manchester School," which he has advanced from time to time in various books, pamphlets, and letters to the press. The work is divided into forty-seven chapters, and there are two appendices and an adequate index.]

Whittall (W. J. H.). An elementary lecture on the theory of life assurance. 2nd edit. 43 pp., 8vo. London : C. and E. Layton, 1909. Price 2s. net.

[A valuable book to those engaged in life assurance who have not time or opportunity to study the larger works on the subject. There is a note on the use of logarithms at the end of the book and an appendix of tables.]

Germany. Medicinalstatistische Nachrichten . . . herausgegeben vom K. Preuss. Stat. Landesamte. Erster Jahrgang 1909. Hefte 1 and 2. 8vo. Berlin, 1909. Price 6 marks yearly, and 1 mark 50 pf. for each part.

[This publication will be issued quarterly, and will replace the annual statistics of mortality and causes of death and of sickness in Prussia which have hitherto been issued as part of the series "Preussische Statistik."]

Institut International d'Agriculture. L'organisation des services de statistique agricole dans les divers pays. Tome 1. 8vo. Rome, 1909.

[This volume contains monographs dealing with the organisation and methods for the collection of agricultural statistics in 22 of the countries whose Governments signed the Convention of 1905, establishing the Institute. One of the objects of the Institute being to concentrate, study, and publish statistics dealing with production, trade, and prices of agricultural products in different countries, it became necessary in the first instance to ascertain the exact signification of the figures with which the Institute would have to deal. Hence the present volume, which is of great value to all interested in international statistical comparison.]

CURRENT NOTES.

So far, the year 1910 has not belied the hopeful anticipations generally entertained at the end of last year. Trade has opened fairly well. In one respect, at any rate, it has surpassed them, for, although an easy money market was looked for during January, comparatively few expected a further reduction of the Bank of England rate to $3\frac{1}{2}$ per cent. The reduction took place on January 20, and was no doubt justified on the information before the directors; a further decline might perhaps have been looked for early this month if the Bank had not lost gold by withdrawals for export without making good the depletion thus caused by continuing to secure the bulk of the South African arrivals.

Money has remained very abundant, much more so than is usual at this season, when, in normal years, the collection of the income-tax has begun to affect the supply of cash in the market. It is true that unusually large amounts of Treasury bills have been placed during the last few weeks, and have, to some extent, taken the place of the income-tax as an agent for absorbing surplus cash, but as few have been issued as possible, and the public deposits of the Bank of England, though larger than they were a year ago, are less than at the corresponding dates in previous years. In consequence of this plethora of money the discount rate has continued to give way. Bills have been scarce, and in some cases takers have been eager; but, as a rule, bill cases have been merely replenished. More recently a disposition to part with bills has been perceptible among the discount houses. Early this month a sharp fall took place in silver, owing to the temporary cessation of the Chinese demand, due to special causes.

The Stock markets have been very slack and much dependent on external influences, such as heavy "breaks" of prices in New York, where several failures have occurred; uncertainty as to home politics, and uneasiness as to the course of events in the Near East, where the irrepressible Cretan question is once more becoming acute. Prices have benefited little by the ease of money, partly, perhaps, because this ease is not altogether trusted, and also because there have been quite a number of new issues since the year began, especially a fairly big Canadian loan. Other fresh demands for capital on a still bigger scale are hanging over the markets, including 10,000,000*l.* for Brazil, a Bulgarian loan, and Austro-Hungarian issues of unknown dimensions. Complaints on this score are, of course, idle; new issues are inconvenient for holders of existing securities, especially when the latter are still partially

unplaced ; but, after all, the *raison d'être* of Stock exchanges is the creation of and dealing in stocks. In the United States there has been an enormous creation of new bonds—most of them second rate—during the past year, and the difficulty of “marketing” them has been considerable. The public in Europe are much better critics of this class of security than they used to be, and scrutinise them severely whenever they appear. This attitude is, to some extent, beneficial to the older and well-proved issues, but the flood of new securities keeps markets rather dull. There has been some cessation of the buying of rubber shares, with the natural result that they have declined, the market in them being “all one way.”

Mr. Sauerbeck's index-number of prices for January is 77·1, the average of the eleven years 1867-77 being taken as 100. This advance on the index-number for December, which was 76·3, is due to articles of food. Corn was firm, and sugar a little dearer, while beef, mutton and butter were higher. There was no change in materials, and the fall in cotton was almost compensated by better prices for coarse wool, flax and jute. Iron was firmer, tin lower, and coal higher. The index-number for food has risen from 72·0 in December to 73·8, or by 2·5 per cent., while materials remain at 79·4.

A number of alterations have been made in the Monthly Accounts of Trade as from January 1, chiefly in regard to articles which were formerly classed together, and are now shown separately. Thus, aeroplanes, airships and balloons, formerly included in “carriages, &c., other descriptions and parts thereof,” become a separate item. Similarly, with regard to trade in particular commodities, many countries formerly classed together under “other countries” are now named separately.

The trade returns for the month of January, as will be seen from the subjoined tables, are again generally satisfactory. There is a large increase in exports of manufactured articles as compared with January of last year, while both imports and exports show a general improvement. In the comparison with a year ago allowance should, however, be made for higher prices. The imports of cotton for the month amount to only 1,408,800 cwt. of the value of 5,840,000*l.*, as against 3,462,000 cwt. of the value of 9,291,000*l.* in January, 1909.

Imports.	January, 1910.	Increase (+) or decrease (—) in January, 1910, compared with January, 1909.
Imports, value c.i.f.—	£	£
I. Food, drink and tobacco	21,610,055	+ 2,448,726
II. Raw materials and articles mainly unmanufactured	21,708,297	— 1,352,239
III. Articles wholly or mainly manufactured	12,374,521	+ 1,360,302
IV. Miscellaneous and unclassi- fied (including parcel post)	228,281	— 35,999
Total merchandise.....	55,921,154	+ 2,420,790
Imports of bullion and specie	4,295,457	— 143,336

Exports.	January, 1910.	Increase (+) or decrease (—) in January, 1910, compared with January, 1909.
Exports, of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£
I. Food, drink and tobacco	1,623,602	+ 177,075
II. Raw materials and articles mainly unmanufactured	3,982,088	+ 266,036
III. Articles wholly or mainly manufactured	28,609,053	+ 5,692,072
IV. Miscellaneous and unclassi- fied (including parcel post)	583,372	— 135,114
Exports of foreign and colonial merchandise, value f.o.b.—		
I. Food, drink and tobacco	892,783	— 13,712
II. Raw materials and articles mainly unmanufactured	4,948,102	+ 1,265,822
III. Articles wholly or mainly manufactured	2,277,096	+ 189,070
IV. Miscellaneous and unclassi- fied (including parcel post)	29,183	+ 18,433
Total, British, foreign and colonial	42,950,279	+ 7,459,682
Exports of bullion and specie	3,968,936	— 2,525,579

Shipping (foreign trade).	January, 1910.	Increase (+) or decrease (—) in January, 1910, as compared with January, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	3,085,902	+ 182,162
Total, British and foreign, <i>cleared</i> } with cargoes	4,107,896	— 98,865

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending January 29, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth-rates.	Mean Death-rates from all causes.
		Births.	Deaths.		
England and Wales (76 great towns).....	16,713,617	31,439	19,482	24·5	15·2
Scotland (8 principal towns).....	1,891,921	3,472	2,600	23·9	17·9
Ireland (Dublin registration area and 21 urban districts)	1,151,790	2,372	1,816	26·8	20·5

The birth-rates show no marked differences from those of the corresponding weeks last year, except in the case of the eight principal towns of Scotland, where the birth-rate ranged from 21·6 to 27·2, as compared with 25·6 to 30·7 in 1909. The death-rates correspond fairly closely.

According to the Registrar-General's Quarterly Return just issued, the birth-rate in England and Wales during the last quarter of 1909 was 24·3 per 1,000, which is 2·3 per 1,000 below the mean birth-rate in the ten preceding fourth quarters. This is the lowest birth-rate recorded in any fourth quarter since the establishment of civil registration.

The following returns relating to pauperism, from data supplied by the Local Government Boards in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for January, 1910:—

Selected urban districts.	Paupers on one day in the second week of December, 1909.				Increase (+) or decrease (—) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	81,529	44,593	126,122	264	+ 3	— 11
West Ham	5,215	11,851	17,096	227	+ 1	— 30
Other districts	75,829	125,723	201,552	216	+ 5	....
Scotland	11,775	35,698	47,473	225	+ 7	+ 1
Ireland	16,021	12,537	28,558	257	+ 7	— 7
Total, December, 1909	190,399	230,402	420,801	233	+ 5	— 4

According to the Board of Trade *Labour Gazette*, the state of the labour market in December was as follows :—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
December, 1909	416	692,153	45,963	6.6
November, 1909	416	696,415	45,569	6.5
December, 1908	416	679,060	61,619	9.1

Employment in December was, on the whole, much the same as in November ; while, as compared with a year ago, all the principal industries, except cotton, showed an improvement. In spite of a seasonal decline in the building and printing trades, and the usual holiday suspensions at the end of the year, the net increase in the percentage unemployed as between November and December was 0.1 only, as compared with an average increase of 0.6 in the ten years 1899–1908.

The general decline in employment which began during the second half of the year 1907 continued throughout 1908, but in the past year, and especially during the latter half, there has been a marked improvement. With the exception of the cotton trade, which has been adversely affected by the high price of raw material, all the principal industries showed considerable improvement in employment at the end of 1909 as compared with the end of 1908. The returns, which relate to nearly 700,000 members of trade unions, show that the means of the percentages of members returned as unemployed at the end of each month, during the past ten years, were as follows :—

1900....	2.5	1902....	4.0	1904....	6.0	1906....	3.6	1908 ...	7.8
'01....	3.3	'03....	4.7	'05....	5.0	'07....	3.7	'09....	7.7

The first International Congress of the Administrative Sciences will be held in Brussels from July 27 to 31, 1910, at the Palais des Fêtes et des Congrès in the grounds of the Universal Exhibition. The Congress will devote its attention to matters “relating to the “services, the organisation, the staff and the action of governments, “and to the most practical methods to be employed by them”; and the discussion of these subjects is to be stimulated by an exchange of authoritative publications. The example of the “Städteausstellung” held in Dresden some years ago, and of a similar exhibition of municipal enterprises organised in Amsterdam by the Dutch

Federation of Municipal Clerks and Officials in 1906, is to be followed, but on a somewhat more ambitious scale. The Congress will be divided into four sections, dealing respectively with municipal government, intermediate organisations between the State and the local authorities, organisation of central authorities and general questions, and, lastly, administrative literature. A British Committee has been formed under the auspices of the Belgian Minister, the Bishop of London, Lord Curzon, the Speaker, Sir Charles Dilke, Sir William Anson and others. Inquiries may be addressed to the Honorary Secretary of the British Committee, Mr. G. Montagu Harris, County Councils Association, Caxton House, Westminster, S.W.

The first Annual Report of the Chief Medical Officer of the Board of Education for the year 1908 has been recently issued. Dr. Newman prefaces his report with a history of the medical inspection of school-children, and the subsequent chapters form a valuable record of the work that has been accomplished under the Act of 1907. Whereas before 1907 only a small minority of local education authorities had made any arrangements for medical work in the public elementary schools, all the 328 authorities in England and Wales are now endeavouring to make adequate provision for the medical inspection of children, and for meeting the questions of school hygiene that are raised thereby. No one will desire to undervalue the work that has been done by the Medical Department of the Board during this difficult period of organisation, but it is impossible to avoid expressing some disappointment at the failure of the Chief Medical Officer of the Board to carry out in his own report the spirit of the recommendation of the Board as to the inclusion of statistical matter in the reports of school medical officers. In Circular 576 it was definitely recommended that such reports should include statistical records of the number of children examined, the number and character of diseased conditions found at certain age periods, and particulars as to blind, deaf, defective and epileptic children; and it was added that it would be well, as far as practicable, "to make systematic comparisons of the individual and collective measurements and characteristics of the children in each school with standard and local records, both as a means of determining the condition of health of particular children or classes, for guidance in future action, and as part of the anthropometric survey to which this Act should contribute in due time." There are only a few sporadic statistical data as to the results of inspection given in the whole of the present report—the reader who turns to the

"anthropometric tables" referred to in the Contents will find only a reprint of two tables from the Report of the Anthropometric Committee of the British Association of 1883—and it is hardly too much to say that the text of the report exhibits, not merely a failure to appreciate the value of statistics, but even a suggestion of bias against statistical records of any kind. Most medical officers of health would, we believe, disagree with what is apparently Dr. Newman's view, namely, that the compilation of the elaborate records, which are now collected, into statistical tables in a form available for comparison, would be merely of "academic" interest. Nor is that view supported by the Report of the Royal Commission on Physical Training (Scotland), nor by the Report of the Inter-Departmental Committee on Physical Deterioration. It will readily be admitted that during the past two years the energies of the medical department of the Board may have been almost wholly devoted to problems of organisation and administration, but now that the congestion of work is somewhat lessened it would be highly desirable that the statistical side of the matter should receive some attention.

The "Bulletin of Revenues and Expenses of Steam Roads in the "United States" for the nine months ending March 31, 1909, and also for the months of April, May, and June, 1909, have been received. This return, which is published at Washington by the Interstate Commerce Commission, is intended to take the place of the preliminary report on the Income Account of Railways. The Bulletin embodies a "system index" and mileage table, showing the railway systems or roads named, and the mileage operated by each system or road at the end of each month. There is also a table, showing by months the revenues and expenses of railway systems or roads operating 500 miles of line or more for the nine months ending March 31, 1909, compared with the nine months ending March 31, 1908. The "system index" gives in alphabetical order those railway systems or roads, 55 in number, which operate more than 500 miles of line. Under each system will be found the names and the mileage of the roads which it comprises, the basis for the grouping being "statements of the carriers relative to leases "or contracts, and to the investments of one corporation in the "securities of another corporation." It is hoped in this way to "establish and perpetuate control." It is, however, added that since changes in the operating control of roads are of comparatively frequent occurrence, this "system grouping" should not be accepted as final, since it is subject to revision and correction as official information may seem to warrant. Table II contains summaries of

the monthly reports of revenues and expenses of the 55 "railway systems or roads" mentioned in the index. The table covers 90 per cent. of the mileage, *i.e.*, 206,095 miles of line, and accounts for 94.65 per cent. of the total operating revenues and for 94.53 per cent. of the total operating expenses of steam roads in the United States.

The thirteenth Census of the United States, which is being taken this year, comprises returns of the acreage, yield, and value of crops in 1909, and the acreage of crops and number of live-stock in 1910. As the annual returns issued by the Department of Agriculture at Washington are based on estimated percentages of increase and decrease since the last census in 1900, the new figures will enable the estimates to be adjusted, and will establish fresh data for the future. The December number of the *Crop Reporter* calls attention to the fact that the recent Census Act not only provides for the thirteenth and subsequent decennial censuses, but provides in addition "that there shall be in the year 1915, and once every ten years thereafter, a census of agriculture and live-stock which shall show the acreage of farm lands, the acreage of the principal crops and the number and value of domestic animals on the farms and ranges of the country." This census is to be taken on October 1, and will relate to the current year. The provision thus made for quinquennial agricultural censuses will greatly increase the accuracy and value of the official yearly estimates of crops and live-stock in the United States.

The International Agricultural Institute established at Rome has, after a somewhat prolonged period of preparation, now commenced active operations. It embraces in its scheme the collection, consideration and distribution of varied information in relation to the world's agriculture, but its statistical side is mainly of interest to this Society. The Division of Statistics is under the charge of Dr. Clark, F.S.S., whose experience as Associate Statistician of the United States Department of Agriculture eminently qualifies him for the important and responsible position which he now holds. The first number of the *Bulletin of Agricultural Statistics* was published by the Institute at the end of last month and will be issued monthly in future. It contains an "outline of the statistical service for 1910-11," and sets forth the aims and objects of the Institute in this connection. It has been wisely decided to attempt in the first instance to obtain statistics for only a limited number of products and it is recognised that the information available must at the outset be incomplete. It may

fairly be hoped that the influence of the Institute will gradually, if not speedily, induce the Governments of those countries whose equipment for the collection of agricultural statistics is now imperfect, to extend and improve their present systems. The Institute requests the various Governments "to reorganise their services of agricultural statistics, if such services exist, otherwise to adopt such a service as will enable replies to be made" to the questions which are to be periodically put to them. The Institute "abstains from proposing any method for the collection of data, or any uniform service, being of opinion that the methods should be chosen by the Governments themselves, according to the particular conditions existing in each country"—a very judicious decision. The Institute was founded under the especial favour of the King of Italy who has most generously endowed and actively supported it, and the convention constituting it is adhered to by 46 States.

It is announced in the *Bulletin* above mentioned that in Italy "le relèvement pour la formation du cadastre agricole, qui correspond à un recensement général des cultures et des produits agricoles" was completed on December 31 last.

With the issue for January the *Zeitschrift für Socialwissenschaft* commences a new series under the editorship of Dr. Ludwig Pohle. National economics will, as heretofore, occupy an important position in the journal, but articles of general interest on questions of social history, sociology, or on the theory of evolution as applied to human societies, will also be welcomed. The January number includes an editorial article on the fluctuations of trade and industry, with especial reference to the state of trade in 1909. Dr. Pohle concludes that in Germany, as in this country, 1909 marked the passing of the depression and the commencement of improvement in trade. While the upward trend will probably continue during 1911, the state of the money market, he considers, gives some cause for anxiety, and it will be well not to hope too much as regards the duration and intensity of the movement. Among the miscellanea is an abstract of an article in the *Korrespondenzblatt der General-kommission der Gewerkschaften Deutschlands* on the movement of wages and cost of living in Germany, suggesting that wages have risen more than the cost of living, and that the rise in rents, of which so much has been heard, is in part at least due to improvement in the quality of the dwellings.

The miscellanea also include a comparative report on workmen's dwellings in Freiburg im Breisgau and in Richmond, Surrey, which is of some interest. The report appears to have arisen out of inquiries made by the municipality of Freiburg, in consequence of complaints as to the cost of dwellings provided by them, supported by an allegation that these things were much better done in England. The houses in Freiburg are three-storied buildings accommodating several families, as is usual in German cities, while the single-family house is overwhelmingly predominant in Richmond. The English houses have more rooms but the rooms are much smaller, and the houses more lightly constructed, the English cottage having 9-in. walls, the German house 15-in. to 20-in. walls. The average cost of construction, excluding the cost of the building plot, &c., is said to work out at 35.2 marks per cubic metre for the Richmond cottages and 33.6 for the Freiburg houses. But the choice of Richmond, in these days practically a suburb of the metropolis, for purposes of comparison, seems to need some explanation.

A report on the activity of the building trade and on the demand for dwellings during the years 1906 to 1908-9 has recently been issued by the Statistical Bureau of Berlin. The report contains a number of very detailed tables relating to the number of new houses erected, the number of dwellings standing empty, and similar matters. Of recent years the building trade in Berlin has reflected the general depression of industry: in 1906 new buildings with over 22,000 dwellings were erected, while in 1907 the number of new dwellings provided was only 14,000, and in 1908, 11,000. The percentages of empty dwellings during the past few years are given as: 1906, 2.03 per cent.; 1907, 2.40 per cent.; 1908, 3.18 per cent.; 1909, 4.43 per cent., the data referring to January 1 in each year, and the figures for 1906 and 1907 being to some extent dependent on an estimate of the number of inhabited dwellings. Very full particulars are given as to the rent, number of rooms, &c., in the dwellings standing empty on the date named.

The January number of the *Journal of Political Economy*, published by the University of Chicago Press, contains an interesting note by Mr. J. D. Magee on the world's production of gold and silver from 1493 to 1905. The tables up to 1885 are based on Adolf Soetbeer's estimates in his "Materialien zur Erläuterung und Beurteilung der "Wirtschaftlichen Edelmetallverhältnisse und der Währungsfrage" and his "Edelmetallgewinnung und Verwendung in den Jahren "1881 bis 1890." After 1885 they are based on the reports of the

Director of the United States Mint, who since 1873 has made an annual estimate of the production of gold and silver in the world for the preceding year. Since 1896, however, another table, giving the production of gold and silver after the discovery of America, has been included in these reports. This table appears to be based on the figures of Soetbeer only to 1885, and on the annual estimates of the Director of the United States Mint for subsequent dates. Soetbeer's figures have, therefore, been adopted exclusively up to 1885 by Mr. Magee. They are familiar, especially to those who have studied the reports of the Gold and Silver Commission, for whose use a special translation of Soetbeer's first-named work was issued. The following table, extracted from Mr. Magee's note, summarises the results which have been obtained :—

Production of gold and silver by weight.

Period.	Gold.	Silver.
	Ounces.	Ounces.
1493-1850	152,782,516	4,817,078,240
1851-1875	153,539,850	996,795,500
1876-1895	119,845,764	2,177,804,911
1896-1905	140,268,348	1,668,443,564
1493-1875	306,322,366	5,813,873,740
1851-1895	272,885,614	3,174,600,411
1493-1895	425,678,130	7,991,678,651
1893-1905	565,936,478	9,660,122,215

The first number of the *L'Egypte Contemporaine*, the journal of the "Société Khédiviale d'Economie Politique, de Statistique et de "Législation," has been published in Cairo. This society, which was founded last year, has in view "not only the instruction of its "own members, but also that of the public," and contemplates a wide sphere of usefulness. The statistical information in the January journal includes a number of statistical tables by M. I.-G. Lévi, on the working of the Suez Canal since its opening to traffic, and an effective diagram by M. Ad. Cattau on the fluctuations of cotton "futures" on the Bourse of Alexandria from November, 1908, to October, 1909. The journal is published for the most part in French, but there is one article in English by Mr. W. V. Shearer, and it is apparently intended in future to admit articles in both languages.

The report of the proceedings of the twenty-third Conference of the Union of German Municipal Statisticians, which was held in Frankfort-on-Main in September last year, has now been received.

Most of the heads of the various municipal Bureaux of Statistics were present. The subjects considered included the forthcoming German Census of 1910, which was discussed under several heads, the methods of estimating the number of unemployed, statistics relating to the municipal care of infants, meat prices, and statistical nomenclature.

A comprehensive paper on "Our Trade with the United States of America," which was read by Mr. Barnard Ellinger before the Manchester Statistical Society on December 8, 1909, has now been published in pamphlet form. The inquiry extends over the years 1883 to 1907, and is illustrated by a detailed table of exports and eight charts.

By the death of M. Léon Walras, at the age of 76, economic science loses one of the most distinguished exponents of the mathematical school with which his name will always be associated. His interests, however, extended beyond pure theory. He took an active part in the co-operative movement of 1863-1867 in France, and throughout his life he closely followed practical political questions. In the course of his jubilee address last year he reiterated his belief that the school he had founded would make for peace and the welfare of humanity, since science and politics were inter-dependent. A Frenchman by birth, M. Walras would have preferred to take up an appointment in France had the opportunity offered; but the share he had taken in the co-operative movement debarred him from any official activity, and in 1869 a chair of Political Economy was specially created for him at the University of Lausanne. His work, *Eléments d'économie politique pure*, was published between 1874 and 1877.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine—

December, 1909—Grain merchants' books : *Sym (Hugh G.)*.

January, 1910—The examination of securities : *Haldane (H. W.)*.

February, 1910—Winding up of a sequestrated estate. Part I : *Macfarlan (Robert)*.

Banker's Magazine. February, 1910—The progress of banking in Great Britain and Ireland during 1909. No. 2. The increase in the number of offices opened. Credit and trade. The budget and direct taxation. The influence of the taxation of capital upon the welfare of a country : *Palgrave (Sir R. H. Inglis)*. Credit and trade in the United States and Canada. London bankers' clearings in 1909. Banking economics. Insurance results in 1909.

Economic Review. January, 1910—The landlord : *Bussell (Rev. Dr. F. W.)*. The conditions of distress. An investigation of 4,000 Birmingham cases : *Birchall (E. V.)*. India and the opium traffic : *Barker (D. A.)*. Karl Marx's theory of value : *Joseph (H. W. B.)*. Legislation, parliamentary inquiries, and official returns : *Dougan (Rev. J. L.)*.

Financial Review of Reviews. February, 1910—The first principles of investment, with preface by Henry Lowenfeld : *Crozier (Dr. J. B.)*. Iron and shipbuilding investment outlook : *Taylor (B.)*. "Gilt-edged" stocks ; their destiny : *Kuhn (Oscar)*.

Journal of the Board of Agriculture. January, 1910—The organisation of the milk supply : *Harris (J. N.)*. Suggestions for pig feeders. Imports of agricultural produce in 1909.

Journal of Institute of Actuaries. January, 1910—Assurance Companies Act, 1909. American railway securities as investments for insurance companies : *Ansell (Hubert)*. Legal notes : *Barrand (A. R.)*.

Journal of Institute of Bankers. February, 1910—Bankers' advances on Stock Exchange securities : *Butterworth (A. R.)*. The work of the London bankers' clearing house during the year 1909.

United Empire : The Royal Colonial Institute Journal, 1910—

January—The Canadian fruit industry : *Mackinnon (W. A.)*.

February—Australia's golden fleece : *Gullett (H. S.)*. Raiffeisen in India : *Colvin (I. D.)*. Irrigation in its relation to agriculture and colonisation : *Peterson (C. W.)*.

Royal Philosophical Society of Glasgow. Proceedings. Vol. 40. 1908-09—Some causes of crime : *Decon (James)*. Some considerations on Scottish universities, with special reference to needed reforms : *Muirhead (R. F.)*. The principles of municipal taxation : *Muirhead (J.)*. The laws of individual growth : *Gray (Arnold H.)*. Physique of Glasgow children ; an inquiry into the physical condition of children admitted to the City of Glasgow Fever Hospital, Belvidere, during the years 1907-08 : *Macgregor (Alexander S. M.)*.

UNITED KINGDOM—*Contd.*

Surveyors' Institution. Transactions. Session 1909-10—

Part 3—Local taxation and the compound householder : Hull (C. P.).

Part 4—Housing, Town Planning, &c., Act, 1909 (continued in Part 5) : Willmot (John).

UNITED STATES—

Bankers' Magazine (New York)—

December, 1909—The teller and his task : Kniffin (W. H.).

Post-mortem administration of wealth : Remsen (Daniel S.).

January, 1910—British economic and political conditions ; a retrospect and a forecast : Lawson (W. R.). The United States Treasury : Smith (W. H.).

AUSTRIA-HUNGARY—

Statistische Monatschrift, November, 1909—Zur Statistik der Privatanlage : Hoegel (H. Dr.). Die Säuglingssterblichkeit in Österreich : Rosenfeld (Dr. S.).

FRANCE—

Annales des Sciences Politiques. January, 1910—Le système commercial de Colbert. I : Arnaudé (A.). L'Éthiopie et l'expansion européenne en Afrique orientale (avec une carte) : Ferry (R.). Le concentration des banques de province en France : Barety (Léon). La propriété artistique et littéraire et la Conférence de Berlin (1908) : Poinsard (Léon). Chronique industrielle : Bellet (Daniel).

Bulletin de Statistique, Ministère des Finances. December, 1909—Production des vins et des cidres en 1909. Les fabriques de sucre et leurs procédés de fabrication. Allemagne : Le projet de budget de l'Empire pour 1910. Russie : Le projet de budget pour 1910.

Journal des Économistes, January, 1910—1909 : Guyot (Yves). Le marché financier en 1909 : Raffalovich (A.). Les comptes des exploitations industrielles de l'État : Schelle (G.). L'état actuel de la question des retraites ouvrières en France : Bellom (Maurice). La délimitation de la région du vin de Bordeaux : Nicolai (M.). Le nouveau tarif des douanes à la Chambre des députés : Cohen (M.). Le crédit : Passy (Frédéric).

Journal de la Société de Statistique de Paris. January, 1910—Notes sur la statistique en France au milieu du dix-huitième siècle : Schelle (G.). L'annuité successorale en France et la population (1876-1906) : Meunier (Paul). Statistique des accidents sur les chemins de fer : Bernard (M.).

La Réforme Sociale—

January 1, 1910—La mutualité agricole : Montet (Eugène). La lutte contre la desertion des montagnes : Sallily (de).

January 16, 1910—Les nouvelles cités-jardins en Angleterre. Le soleil et l'habitation populaire : Risler (Georges). L'action sociale des mutualités rurales : Clercq (J. de). L'exode rural en Bretagne : Choleau (Jean).

FRANCE—Contd.

Revue d'Economie Politique. January, 1910—L'actionnariat ouvrier : *Gide (Charles)*. Les valeurs mobilières et les projets de réforme fiscale : *Truchy (Henri)*. Le libre-échange et le protectionnisme au Congrès de Londres d'août 1908 : *Dalla-Volta (R.)*. La situation de la propriété rurale en France d'après une récente enquête officielle : *Augé-Laribé (M.)*.

GERMANY—

Archiv für Rassen- und Gesellschafts-Biologie. November—December, 1909—Über die deutschen Süßwasser-Polypen *Hydra fusca* L. *Hydra grisea* L. und *Hydra viridis* L. Eine biologische Vorarbeit, zugleich ein Beitrag zur Vererbungslehre : *Hase (Dr. A.)*. Der Rückgang der Stilltätigkeit der Frauen und seine Ursachen auf Grund der neuesten amtlichen Statistik : *Claussen (Dr. Walter)*. *Archiv für Sozialwissenschaft und Sozialpolitik.* January, 1910—Karl Marx und Michael Bakunin : *Bernstein (E.)*. Die Soziallehren der christlichen Kirchen. III. Hauptteil : Der Protestantismus. II : *Troeltsch (Prof. D. E.)*. Haushalts-Budgets Petersburger Arbeiter : *Prokopowitsch (S.)*. Zur Lage der Kontorlehrlinge in Baden : *Heinze (Dr. F.)*. Ueber den internationalen Syndikalismus : *Cornélissen (C.)*.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft (Schmoller's). Heft 1, 1910—Ausblicke auf die künftige preussische Wahlreform : *Siegfried (R.)*. Zur Theorie der Sozialwissenschaften : *Neurath (Otto)*. Über das Verhältnis Steins zur französischen Revolution : *Küntzel (Georg)*. Die neue nordamerikanische Stahlstadt : *Schultze (Ernst)*. Die Kötner-, Hausler-, und Einliegerklassen in Schweden. II : *Wohlin (Nils)*. Die Reform der Budgetierung in den österreichischen Landesfinanzwirtschaften : *Kompert (Paul)*. Das Problem gesetzlicher Aufnahme der Barzahlungen in Österreich-Ungarn : *Federn (Walther)*. Die Listsche Idee einer deutsch-englischen Allianz in ihrem Ergebnis für Deutschland : *Sevin (Ludwig)*. Das Persönliche im modernen Unternehmertum : *Wiedenfeld (Kurt)*. Der Haushalt des kleinen Mittelstandes und der Arbeiter : *Günther (Ernst)*. Die Neger und die europäische Zivilisation : *Rathgen (Karl)*. Einiges zur Statistik der landschaftlichen Pfandbriefe : *Brockhage (Bernhard)*. Das Hamburger Volkseinkommen im Jahre 1907 : *Man (R. E.)*. Zur Psychologie des englischen Geistes. Eine kulturhistorische Studie : *Bernhard (Ernst)*. *Jahrbücher für Nationalökonomie und Statistik (Conrad's).* January, 1910—Das französische Sparkassenwesen : *Schachner*. Die Gesetzgebung in den Vereinigten Staaten von Amerika zum Schutze der Fabrikarbeiter, namentlich der weiblichen und jugendlichen Personen, ferner der Heimarbeiter : *Leichenfeld-Köfering (Graf H.)*. Einige Ergebnisse der neuesten deutschen gewerblichen Betreibserhebungen : *Conrad (J.)*. Die Aktien-gesellschaftsstatistik des Kaiserlichen Statistischen Amtes in Berlin : *Moll (Ewald)*. Die Wohlfahrtseinrichtungen des Kreises Worms : *Kesten (E.)*. Schiffsfahrtsringe und Frachtrabatte : *Pupke (W.)*.

GERMANY—*Contd.*

Zeitschrift für die gesamte Staatswissenschaft. Heft 1, 1910—

Wirtschaftswissenschaft und Wirtschaftspolitik: *Cohn (Gustav).*

Die persönlichen Dienstleistungen im Rahmen der wirtschaft-

lichen Güter: *Kirschner (Paul).* Das französische Hypotheken-

bankwesen: *Schmidt (Fritz).* Die rechtlichen Grundlagen

der Anleihepolitik der deutschen Städte: *Berthold (Willy).*

Menschenschmuggel und gelbe Gefahr in den Vereinigten

Staaten: *Schultze (Ernst).* Zur Einführung der „Steuer nach

dem gemeinen Wert“ in Oldenburg: *Ephraim (Hugo).* Ursprung

und Lage der Landarbeiter in Livland. I: *Tobien (Alexander).*

Zeitschrift für Versicherungs-Wissenschaft. Heft 1. January, 1910—

Kritische Bemerkungen zur Mietsverlustversicherung für

Berlin: *Seeger (Dr.)* und *Beck.* Ein Streifzug durch die

Haftpflichtversicherung der Vereinigten Staaten: *Serini (Dr.).*

Über Kollektiv-Unfallversicherung an deutschen Hochschulen:

Josef (Dr.). Zum Problem einer Telegrammversicherung:

Nietschmann.

ITALY—

Rivista Italiana di Sociologia. September—December, 1909—

Cesare Lombroso e la funzione sociale della scienza: *Ferri (E.).* La

terra e la vita sociale: *De la Grasserie (R.).* Sulle origini del

regime comunistico nel matrimonio: *Ercole (F.).* Per la

prevenzione della criminalità giovanile: *Martinazzoli (A.).*

SWITZERLAND—

Journal de Statistique Suisse. Lief. 1, 1910—Die Organisation der

nächsten eidg. Volkszählung: *Guillaume (Dr.).* Ehe, Geburt

und Tod in der glarnerischen Bevölkerung: *Weber (Dr. Felix).*

Das Lotteriewesen in der Schweiz: *Näf (E.).*

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended February 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria-Hungary—

- Labour. Die kollektiven Arbeits- und Lohnverträge in Österreich. Abschlüsse und Erneuerungen des Jahres 1907. 8vo. 1909. (The Austrian Labour Department.)
- Ergebnisse der Arbeitsvermittlung in Österreich in den Jahren 1907 und 1908. 8vo. 1909. (*Id.*)
- Vorschriften über die Sonntagsruhe im gewerblichen Betriebe Österreichs. 8vo. 1909. (*Id.*)

Belgium—

- Education. Rapport triennal sur la situation de l'instruction primaire en Belgique. 21^e période triennale 1903-04-05. Fol. 1908. (The Registrar-General of England.)
- Situation de l'enseignement supérieur donné aux frais de l'État. Rapport triennal. Années 1904-05-06. Fol. 1909. (*Id.*)
- Fisheries. Enquête sur la Pêche maritime en Belgique. Introduction. Recensement de la Pêche maritime. 8vo. 1909. (The Belgian Labour Department.)

France—

- Colonies. Gouvernement Général de Madagascar et Dépendances. Statistiques générales. Situation de la Colonie au 31 Décembre, 1907. Population. Administration. Justice. Enseignement. Agriculture. Industrie. Commerce. Navigation. 4to. 1908. (The French Colonial Office.)

Germany—

- Census. Berufs- und Betriebszählung, 1907. Berufsstatistik. Abteilung 4. Die Bevölkerung der Bundesstaaten ausser Preussen nach Haupt- und Nebenberuf. 4to. 1910. (The Imperial Statistical Bureau.)
- Berufs- und Betriebszählung, 1907. Gewerbliche Betriebsstatistik. Abteilung 7. Kleinere Verwaltungsbezirke Bundesstaaten ausser Preussen. 4to. 1909. (*Id.*)
- Berufs- und Betriebszählung, 1907. Landwirtschaftliche Betriebsstatistik. Teil I. Betriebe der landwirtschaftlichen Arbeiter und Tagelöhner. Art der Bestellung. Die in den Betrieben beschäftigten Personen. 4to. 1909. (*Id.*)
- Mortality Tables. Deutsche Sterbetafeln für das Jahrzehnt 1891 bis 1900. Diagrams. 4to. 1910. (*Id.*)
- Municipal. Verhandlungsberichte über die am 11, 13 u. 14. September 1909 im Stadtverordnetenversammlungssaale zu Frankfurt a. M. abgehaltene xxi. Konferenz der Vorstände Statistischer Ämter Deutscher Städte. Fol. 1910. (The Statistical Bureau of Frankfurt.)

(a) Foreign Countries—*Contd.***Germany—*Contd.****Prussia—*

Insurance. Lebens und Unfallversicherung. Teil 1. 1 Abteilung: Die Lebensversicherung in Preussen 1895-1900. 2 Abteilung: Die Unfallversicherung in Preussen 1891-1900 nebst Übersichten über den Betrieb dieses Zweiges auch in anderen Ländern (nach privaten Quellen). Nachtrag: Betrieb der Lebensversicherung im Deutschen Reich und in anderen Ländern 1900, nach privaten Quellen. (Preuss. Stat. 181.) 4to. 1909. (The Royal Prussian Statistical Bureau.)

Medicinalstatistische Nachrichten. . . . Jahrgang 1, 1909. Heft 1, mit einer Beilage. Heft 2. 3 parts, 8vo and 4to. 1909. (*Id.*)

Berlin. Mitteilungen des statistischen Amts der Stadt Berlin. No. 2. Bautätigkeit und Wohnungsmarkt in Berlin 1906 bis 1908-09. Fol. 1909. (The Municipal Statistical Bureau.)

Netherlands—

Trades Unions. Beknopt overzicht van den omvang der Vakbeweging in het tijdvak 1907-09. 34 pp., 8vo. 1909. (The Central Statistical Bureau.)

Russia—

Le revers de la révolution. L'insurrection en Russie, armée aux frais du Japon. 19 pp., 8vo. St. Petersburg, 1909. (The Editor "Golos Pravdy.")

International—

Institut International d'Agriculture. L'Organisation des Services de Statistique Agricole dans les divers Pays. Tome i. 8vo. Rome, 1909. (Dr. C. C. Clark.)

International Hygiene Exhibition. Dresden, 1911. Programme of the Exhibition, &c. Fol. 1910. (The Secretary.)

(b) India and Colonies.

Natal—

Maize (mealie) cultivation and export. South Africa. 50 pp., 4to. 1909. (The Commercial Agent for Natal.)

(c) United Kingdom and its several Divisions.

United Kingdom—

Canals. Royal Commission on Canals and Waterways. Vol. 1. (Part 1.) First Report of Royal Commission, with minutes of evidence and appendices and indexes. (Proof.) Fol. 1906. (The Right Hon. Lord Farrer.)

— Vol. 1. (Part 2.) Minutes of evidence and appendices accompanying first report (Vol. 1, Part 1) of the Royal Commission. [Cd-3184.] 1906. (*Id.*)

— Vol. 2. (Part 2.) Ireland. Minutes of evidence and appendices accompanying the second report (Vol. 2, Part 1) of the Royal Commission. [Cd-3717.] 1907. (*Id.*)

— Vol. 3. England and Wales and Scotland. Minutes of evidence and appendices accompanying the second report (Vol. 2, Part 1) of the Royal Commission. [Cd-3718.] 1908. (*Id.*)

— Vol. 4. Returns supplied to and prepared by the Royal Commission, 1907. Comprising the history, extent, capital of, and traffic and works on the canals and inland navigations of the United Kingdom. [Cd-3719.] 1908. (*Id.*)

— Vol. 5. (Part 2.) England and Wales and Scotland. Minutes of evidence and appendices of the Royal Commission. [Cd-4840.] 1909. (*Id.*)

— Vol. 6. Foreign inquiry. Report on the waterways of France, Belgium, Germany and Holland, by W. H. Lindley, M.Inst.C.E. (Assistant Commissioner for Foreign Inquiry). Part 1. Reports and appendices. Part 2. Maps and tables. [Cd-4841.] 1909. (*Id.*)

(c) United Kingdom and its several Divisions—*Contd.*United Kingdom—*Contd.*

Poor. Royal Commission on Poor Law and Relief of Distress. Appendix, Vol. 12. Memoranda by Individual Commissioners on various subjects. [Cd-4983.] 1910. (The Commission.)

— Appendix, Vol. 28. Reports of visits to Poor Law and Charitable Institutions and to meetings of Local Authorities in the United Kingdom. [Cd-4974.] 1909. (*Id.*)

England and Wales—

Local Government Board. Report on nature, uses, and manufacture of Ferro-Silicon, with special reference to possible danger arising from its transport and storage. [Cd-4958.] Svo. 1909. (The Medical Officer, Local Government Board.)

London (*City*). Old Age Pension Act, 1908. Return of pensions granted, &c., during the year ended September 30, 1909. 6 pp., fol. 1909. (The City Corporation.)

(d) Authors, &c.

Bernis (*Francisco*). Relaciones aduaneras entre España y Portugal. Estudio arancelario. 76 pp., Svo. Salamanca. 1910. (The Author.)

Brouilhet (*Charles*). Le Conflit des Doctrines dans l'Economie politique contemporaine. viii + 306 pp., sm. Svo. Paris, 1910. (M. Felix Alean.)

Culpin (*Ewart G.*). The practical application of town planning powers. 72 pp., Svo. 1910. (Messrs. P. S. King and Son.)

Elderton (*W. Palin*) and (*Ethel M.*). Primer of Statistics. vi + 86 pp., diagrams, Svo. 1909. (The Author.)

Ellinger (*Barnard*). Our trade with the United States of America. 78 pp., Svo. 1909. (*Id.*)

Fubry (*E.*). Problèmes et exercices de mathématiques générales. 420 pp., Svo. Paris, 1909. (M. A. Hermann.)

Fooble-Minded. The Problem of the Feeble-Minded. Abstract of report of the Royal Commission on care and control of the feeble-minded. x + 113 pp., Svo. 1909. (Purchased.)

Ferraris (*Carlo F.*). Gli iscritti nelle università e negli istituti superiori italiani, 1893-94—1908-09. 15 pp., Svo. 1910. (The Author.)

Galton (*Sir Francis*). Essays in Eugenics. 109 pp., sm. Svo. 1909. (The Eugenics Education Society.)

Goutchambaroff (*S.*). Population du globe terrestre et sa répartition par sexes. (MS.) 33 pp., 4to. 1903. (The Author.)

Hobson (*J. A.*). The crisis of Liberalism. New issues of democracy. xiv + 284 pp., Svo. 1909. (Messrs. P. S. King and Son.)

Hopkins (*J. Castell*)—

The Canadian annual review of public affairs for 1901, 1902, 1904, 1907 and 1908. 5 vols., Svo. Toronto, 1902-09. (The Author.)

Historical sketch of the Canadian club movement. 23 pp., Svo. 1907.

Appendix to the Canadian Annual Review, 1907. (*Id.*)

Ireson (*Frank*). The people's progress. A study of the facts of national wealth, with some answers to Socialists. viii + 159 pp. Diagrams. Svo. 1910. (Mr. John Murray.)

Latham (*Arthur*) and Garland (*C. H.*). The conquest of consumption. An economic study. 185 pp., sm. Svo. 1910. (Mr. T. Fisher Unwin.)

Leener (*Georges de*). L'Organisation Syndicale des Chefs d'Industrie. Étude sur les Syndicats industriels en Belgique. Vols. 1 and 2. (Instituts Solvay. Travaux de l'Institut de Sociologie. Etudes Sociales.) 2 vols., Svo. Brux., 1909. (The Institute of Sociology.)

Mengarini (*Pablo*). Sulla distribuzione per salario dei minatori di carbone del Belgio 1896-1900. 46 pp., Svo. Rome, 1909. (The Author.)

Molesworth (*Sir Guilford*). Economic and fiscal facts and fallacies. xii + 292 pp., sm. Svo. 1909. (The Author.)

JOURNAL OF THE ROYAL STATISTICAL SOCIETY.

MARCH, 1910.

URBAN VITAL STATISTICS *in* ENGLAND *and* GERMANY.

By A. W. FLUX, M.A.

[Read before the Royal Statistical Society, February 15, 1910.]

THE selection by the President of international vital statistics as the subject of his inaugural address in November may be accepted as sufficient evidence of the perennial interest possessed by that group of statistics for the students of statistics who form our Society, and as an encouragement to other members to present for the consideration of the Society some matters related to the same general subject.

The particular section of vital statistics which forms the subject of the present communication is that which relates to the contrasts of urban and rural conditions, and for the purpose of discussing certain of the points which arise, an effort is made to present, for comparison with the figures of our own country, similar figures for a neighbouring country, which, like our own, has made rapid strides in the direction of urbanisation. Had it been possible to devote more time to the preparation of the paper than has unfortunately been the case, it had been proposed to extend the survey over yet other countries. The most readily available foreign statistics of the character needed for the present purpose were those of Germany, and it may be possible to determine, from such comparisons as are here attempted, whether a wider survey would adequately repay the labour which it would necessarily involve.

The increasing influence on the life of the people which must be exerted by the conditions of residence in towns is illustrated by the following figures extracted from a recent Blue-Book¹ :—

¹ *British and Foreign Trade and Industry*, Cd-4954, pp. 16—17.

Years.	England and Wales. Population of urban districts.		Years.	German Empire. Population of <i>Gemeinden</i> with over 2,000 inhabitants.	
	Number.	Proportion to total population.		Number.	Proportion to total population.
		Per cent.			Per cent.
1871	14,041,404	61·8	1871.....	14,790,798	36·1
'81	17,636,646	67·9	'75	16,657,172	39·0
			'80	18,720,530	41·4
'91	20,895,504	72·0	'81.....	20,478,777	43·7
			'90.....	23,243,229	47·0
1901.....	25,058,355	77·0	'05.....	26,257,382	50·2
			1900	30,633,075	54·3
			'05	34,818,797	57·4

Although many of the smaller districts included in the totals of this table may not be of a size to produce the conditions of life most characteristic of modern towns, the rapid increase of the percentage in each case unquestionably connotes an increase in the population of the great towns. Thus the *Statistisches Handbuch für das Deutsche Reich* (Erster Teil, p. 38) gives a table showing the population at each census of the towns which had in 1905 a population of 100,000 or more. These were 41 in number, and had a population of about 11,500,000 in 1905, or rather over three times the population of the same towns in 1871, and nearly six times that of the eight towns which, in 1871, had populations exceeding 100,000. Thus in 1871 under 5 per cent. of the population of the German Empire lived in towns of over 100,000 inhabitants, while in 1905 about 19 per cent. of the population lived in towns of that size. The urbanisation of the population, in the sense of its aggregation in larger urban units, has therefore proceeded more rapidly than is indicated by the percentages of the above table. In England the number of towns of over 100,000 inhabitants in 1871 was 14, and they contained nearly 6,250,000 people, or about 27½ per cent. of the population. In 1901 the 33 great towns, familiar in certain summaries of the Registrar-General, most of which had over 100,000 inhabitants, and none of which fell far below that figure, contained a population of about 11,500,000, or about the same as that in towns of a similar size in Germany five years later. The proportion of the total population in these large towns in England and Wales was about 35 per cent. in 1901. Thus the rate of increase of the percentage living in the largest towns was much less in England than in Germany, as necessarily follows from the fact that England had already in 1871 a higher degree of urbanisation in the sense just explained than Germany had in 1905.

It is as well to note, perhaps, that a substantial part of the increase in the large towns was due to additions to their area. Thus the report on the German census of 1900, discussing this point, cites a compilation showing that, for 29 of the 33 large towns, having a total population in 1900 of just over 8,000,000, 1,000,000 of the increase since 1871 was due to the extension of areas, the added areas having had a population of barely 240,000 in 1871. What the corresponding figures for England and Wales would be I am unable to state, but there has been, doubtless, no inconsiderable addition due to this cause. This has, however, little importance from the standpoint of the present discussion, since the extensions of area are in many cases but the recognition of the spread of population over areas formerly not very densely populated. The growth of urbanisation may, therefore, not improperly be measured by the increase of population without much qualification on account of the extensions of areas of towns. Such qualification would be more important where the annexed areas had a dense population throughout the period of comparison, which has probably been more generally the case in this country than elsewhere. The German official statistics enable the importance of the previous populations of added areas to be measured, both by recording the populations of the areas of the towns as extended from time to time, and also by recording the populations contained within a radius of $6\frac{1}{4}$ miles (10 kilometres) of the town. For the 29 large towns included in the totals given in the report on the census of 1900, the population within that radius increased from just under 5,000,000 in 1871 to just under 12,000,000 in 1900. This increase is not very much greater proportionately than that of the total of the population in places of over 2,000 inhabitants each.

One further illustration may be given of the manner in which urbanisation proceeds in modern industrial states, if not in all countries, and again use may be made of German census statistics, selecting certain of the tables from the report of the census of 1900. These show the resident population in 1895 and 1900 to have been distributed as follows:—

	1895.		1900.	
	Population.	Per cent. of population of Empire.	Population.	Per cent. of population of Empire.
Towns of 100,000 and over	7,276,993	13·9	9,120,280	16·2
„ 20,000 to 100,000	5,584,000	10·7	7,111,447	12·6
„ 5,000 to 20,000....	7,118,980	13·6	7,585,495	13·4
„ 2,000 to 5,000	6,277,409	12·0	6,815,853	12·1
Total town population	26,257,382	50·2	30,633,075	54·3

Corresponding figures for 1890 are not cited from the census report of that year, as a comparison of the totals with those given for 1890 in the report on the census of 1900 indicates that a revision of the figures has been made, the details of which are not fully stated.

The suggestion of the table just given is that, in the country and period to which they refer, the smaller towns grew in about the same proportion as the general population, but that the towns of 20,000 and upwards grew more rapidly, while the sparsely populated districts grew in population less rapidly than the country as a whole. As a matter of fact, the actual number of persons living in Germany in places of less than 2,000 inhabitants has decreased slightly since 1880. The decrease was shown at each of the enumerations from 1880 to 1900, but a slight recovery was marked in 1905. In 1880 the population of these places numbered 26,513,531, while in 1900 it was enumerated at 25,734,103, and in 1905 at 25,822,481, which was 200,038 less than in 1895.

Between 1895 and 1900 the growth of population of the Empire was 4,087,277, while that living in places of 20,000 or more inhabitants increased by 3,370,734. This increase, had it been proportionate to that of the whole Empire, would have been about 1,000,000. The difference between the distribution of the population in 1895 and 1900 is, therefore, roughly expressed, that about 1,000,000 were found in towns of 20,000 to 100,000, and 1,250,000 in towns larger than this in 1900 who would, had all parts of the population increased proportionally, have been found in places of under 2,000 inhabitants. The failure of the latter to increase in the absolute number of their population is partly due to the inclusion of some of their area in other classes, but would appear to be mainly due to actual migration. The present stage of German towns is one of very active growth due to migration. Our own towns are growing from the same cause, but, inasmuch as a considerable majority of the population has for a good number of years been found in the towns, the scope for such a rapid relative growth by migration as still exists in Germany no longer exists here.

We are able to compare the proportions of native-born to immigrants in 1900 for the great towns of Germany, *i.e.*, those exceeding 100,000 inhabitants. Of the 33 towns, for six only did less than half of their population consist of immigrants. These six were Cöln, Bremen, Elberfeld, Barmen, Crefeld and Aachen. In the latter only 35 per cent. of the population were born outside the town. At the other extreme, putting aside Charlottenburg as exceptionally situated, stood Kiel with only 34 per cent. of its

population born within the town. In Charlottenburg, 81 per cent. of the population consisted of immigrants.

For the 33 towns as a whole, the percentage of immigrants in the population was 56·7. For the nine whose populations were over 250,000, the percentage was 57·2, for the remaining 24, it was 56·1. Thus the proportion of immigrants was only slightly greater for the largest cities than for those of between 100,000 and 250,000 inhabitants.

In each of these groups the percentage of immigrants among the male inhabitants was somewhat greater than among the female part of the population. The percentage for males was also almost the same for each group, being 57·9 for the largest cities, and 57·7 for the others. For females, however, the figures were 56·5 and 54·3, so that the higher proportion of immigrants in the large cities was due almost entirely to the greater immigration of females into the larger than into the smaller of these two groups of towns. The quarter-million cities (Group I) are Berlin, Hamburg, München, Leipzig, Breslau, Dresden, Cöln, Frankfurt a/M, and Nürnberg. The towns of somewhat smaller size (Group II) are the more industrial in comparison taking them as a whole.

The migratory movement of the population has not, however, been wholly one into the large towns from outside. There has been a large migration from these towns to other places, whether of smaller population or other of the large towns. The proportion of those born in the cities of 250,000 inhabitants or more, but not enumerated in the place of birth, was 24·5 per cent., the corresponding figure for the other large towns being 29·6 per cent. The percentage was higher for males than for females in both groups, being respectively 26 and 23 in the largest cities, and 32 and 28 in the other large towns.

In some cases the exchange of population with other places shown by the census figures was remarkable. Thus, over 42 per cent. of the population born in Essen and living in Germany in 1900 were enumerated elsewhere than in Essen, while 61 per cent. of those enumerated in Essen were immigrants to the town. Aachen, whose percentage of immigrant population has already been stated as lowest for the 33 towns, at 35 per cent., had also nearly the lowest percentage of its natives resident elsewhere, namely, 20 per cent.

Comparatively little of the migration to which the comparison of the figures of birth-places and places of residence bears witness took place between the great towns themselves. Of 3,025,497 immigrants into the cities of Group I, 73,480 came from other cities of that group, 146,069 from towns of between 100,000 and 250,000 inhabitants, and the remainder, 2,805,948, from lesser towns or the rural

districts. And of those who had left these great cities, numbering in all 732,556, besides the 73,480 going to others of the great cities, 101,522 went to the towns of between 100,000 and 250,000 inhabitants, while 557,554 were found in smaller towns or in rural districts. Thus the gain of the great cities from places of less than 100,000 inhabitants, over and above the loss to these places, amounted to about 2,250,000, or approximately the number of those both born and resident in these cities.

For the group of towns of from 100,000 to 250,000 there were recorded 2,145,395 immigrants, of whom 86,086 were from other towns of the group, 101,522 from the group of greater cities, and the remaining 1,958,787 from places with fewer than 100,000 inhabitants. There were 706,606 living who had migrated from these towns, 86,086 to other towns of the group, 146,069 to the greater cities, and 474,451 to smaller places. This group of large towns gained, therefore, on balance, about 1,500,000 from places of less than 100,000 population, which number is only a little less than that of the natives of these towns still residing in the places of their birth.

The information tabulated in the census report does not enable us to analyse the sources of the migration further on the basis of the foregoing. In view of what has already been noted, however, it seems likely that the main contributors to the growth of the population of the large towns have been the rural districts rather than the small towns, though this is by no means proved.

The immigration into the towns of from 100,000 to 250,000 inhabitants has been to a considerably greater extent from their immediate neighbourhood than in the case of the greater cities.

For the outward movement from the large towns of less than 250,000 inhabitants a somewhat larger proportion is to places beyond the district or province surrounding the town than in the case of the cities of over 250,000 inhabitants.

A point of very great interest is elucidated by tables given in the German Census Report of 1900 regarding the ages of the natives of the great towns who were resident in their native town at the census, and of those who had migrated from or to those towns. The results are set forth in the tabular summary on pp. 213 and 214 for the cities of over 250,000 and for the towns of from 100,000 to 250,000 separately.

Only in three towns, Aachen, Crefeld, and Bremen, was the proportion of the resident natives under 16 years of age to the total of resident natives less than one-half. The lowest percentage was 45·7 for Aachen. At the other extreme, in Essen, Dortmund and Kiel, about two-thirds of the resident natives were under 16,

Population of German towns classified by birth-places, 1900.

Residents at ages	Under 16.	16 and under 30.	30 and under 50.	50 and under 70.	70 and over.	All ages.
GROUP I.— <i>Cities over 250,000.</i>						
<i>Males.</i>						
Born in the city of residence	624,908	249,781	140,918	50,898	7,935	1,074,440
“ elsewhere in Group I	6,915	15,957	12,501	3,697	421	39,491
“ in Group II	14,919	25,883	22,359	7,413	1,023	71,597
“ elsewhere in Germany	114,264	454,481	502,711	190,651	24,098	1,286,205
“ outside Germany	8,412	35,971	26,436	6,859	673	78,351
Total	769,418	782,073	704,925	259,518	34,150	2,559,084
<i>Females.</i>						
Born in the city of residence	630,616	297,131	172,674	75,553	16,185	1,192,159
“ elsewhere in Group I	7,030	11,576	10,733	3,933	717	33,989
“ in Group II	15,298	23,676	23,790	9,681	2,027	74,472
“ elsewhere in Germany	119,194	451,951	519,571	241,338	46,626	1,378,680
“ outside Germany	8,434	22,674	22,534	7,743	1,327	62,712
Total	780,572	807,008	749,302	338,248	66,882	2,742,012
GROUP II.— <i>Towns between 100,000 and 250,000.</i>						
<i>Males.</i>						
Born in the town of residence	477,753	172,719	99,845	38,898	6,851	796,036
“ elsewhere in Group I	9,327	17,397	12,317	4,050	584	43,675
“ in Group II	14,760	18,354	12,522	3,850	487	49,973
“ elsewhere in Germany	109,227	354,448	326,036	129,511	17,951	947,173
“ outside Germany	5,232	19,391	14,036	3,816	452	42,927
Total	616,299	592,309	464,756	180,125	26,325	1,879,814

while in Charlottenburg the percentage was 77·9. For Group I the percentage averaged 55·4, and for Group II 57·0.

These high figures are, of course, due to the fact that the great majority of the children are born in the towns, even if their parents be immigrants. Under 10 per cent. of the immigrants into the first group were less than 16 years of age, and under 12 per cent. of those into the second group, while 18·4 per cent. and 17·4 per cent. respectively of the non-native population were over 50 years of age.

Of the resident population between 30 and 50, only in one town of the 33, namely Aachen, was the percentage of non-natives below 55, Aachen having a percentage of 46·6. With four exceptions, Aachen, Crefeld, Barmen, and Elberfeld, over half the population between 16 and 30 were immigrants. For the first group as a whole, over three-fourths of the residents between 30 and 50, and 65 per cent. of those between 16 and 30, were non-natives. For the second group, 76 per cent. of those between 30 and 50 years of age, and 67 per cent. of those between 16 and 30, were non-natives.

The age-distribution of migrants from one group of towns to the other was generally similar to that of the immigrants from other parts of Germany, though there was a larger proportion of children among the inter-urban migrants than among the population absorbed into the cities from outside. The foreign-born were also similar in age-distribution to this latter class, though among them the ages over 50 were relatively more strongly represented. About one-fourth of all German residents of foreign (or unknown) birth were resident in the 33 great towns, 141,063 in the nine cities of Group I, and 76,056 in the other 24 towns, or 2 $\frac{2}{3}$ per cent. and 2 per cent. respectively of their total populations. In Berlin there were 39,745, or 2·11 per cent., of the population.

The fact that one-fifth of all those recorded as born in the 33 great towns and resident in Germany were enumerated outside those towns is a somewhat remarkable result of the analysis of the figures. It seems, however, susceptible of a comparatively easy explanation, though the data do not appear to permit of submitting the explanation to a rigid test to determine if it be sound.

There is cited in the report on the census of 1900 a calculation by Dr. S. Schott, of Mannheim, which appears in the *Statistisches Jahrbuch Deutscher Städte*, Elfte Jahrgang, 1903, of the increase of population in the great towns and in their immediate neighbourhood. The figures, to which reference has already been made above (see p. 209), relate to 29 of the 33 towns, Cassel, Crefeld, Halle, and Stettin being omitted. Within a radius of 10 kilometres, in addition to the population resident within the limits of the urban governments of 1900, there were in 1871 about 1,400,000,

or 40 per cent. of the town population, and this number had increased to nearly 3,900,000, or 48 per cent. of the town populations in 1900. In the 12th number of the *Jahrbuch* the subject is further developed, and for 22 of the towns—Berlin, Charlottenburg, Cöln, Elberfeld, Barmen, Kiel and Nürnberg being omitted, as well as those previously named, the full details not being available for these—the population within a radius of 5, 6, 7, 8 and 9, as well as of 10 kilometres is examined. The population examined amounted to 5,260,000 within the towns in 1900, about 900,000 more within the 5 kilometre radius, and 1,737,000 between 5 and 10 kilometres, that is to say, resident in the *Gemeinden* not forming part of the municipal territory, and within this distance of the centre of that territory. Within the inner (5 kilometre) limit, the outlying population had about trebled between 1871 and 1900, while in the belt between 5 and 10 kilometres the increase had been 126 per cent., or almost identical in proportion with the increase of the population within the municipal boundaries (of 1900). We have thus an increase of 600,000 within 5 kilometres, and of a further 970,000 between the 5 and 10 kilometre limits. Besides these numbers, the figures cited above show that nearly 1,000,000 increase occurred in the population living outside of, but within a radius of 10 kilometres of, the towns for which the other details are not available. Of these, nearly 600,000 are accounted for around Berlin.

Taking this fact of exceptionally rapid growth of residents in what may roughly be called suburbs, including outlying industrial districts as well as residential suburbs, with the fact that the age distribution of the emigrants showed no abnormal excess of young adults, we may safely conclude that the exodus from the great towns has not been in any large degree to the villages and rural districts. The suburban population has grown more at the expense of small towns and rural districts than by absorption from the great towns near by, but it has owed a very substantial part of its growth to the exodus from those great towns.

Attention may be directed to a point touched on again later, namely, the greater movement, both inwards and outwards, of males between 16 and 30 than of females at the same ages, though at other ages the latter have the predominance. The results of military service are almost certainly the main cause, if not the sole cause, of this divergence from the general relations between the sexes.

The results of the active interchange of population between country and town and town and suburb are familiar in the contrasts between the age-distribution of urban and rural populations. It is to this reflection of the movement that we must look

for evidence of its activity in our own country, in the absence of such direct information as has been cited above from German records. In the words of the General Report on the Census of 1901 in England and Wales (*loc. cit.*, p. 49): "Sex and Age constitution may fairly be considered the key to Vital Statistics," and these results deserve, in spite of their familiarity, a somewhat more particular consideration than they have, so far as I am aware, hitherto received, and especially in regard to the marked contrast in the degree of the divergence between the age-constitutions of urban and rural populations in this country and in some of the neighbouring continental countries. That the urban population in England contains an excess of young adults of both sexes, and especially of females, is a perfectly familiar fact, and on it is based the correction of death-rates by reducing them to the level corresponding to "standard" population in regard to age-distribution. The contrasts presented by town and country are summed up in the table given below from the General Report on the Census of 1901, p. 214, to which are added, for comparison, the figures for London, both for 1901 and 1891:—

Per 100,000 of the total population.

Ages.	1891.			1901.		
	London.	Aggregate of urban districts.	Aggregate of rural districts.	London.	Aggregate of urban districts.	Aggregate of rural districts.
<i>Males.</i>						
Under 5 years....	5,919	6,117	6,130	5,465	5,702	5,710
5—10 "	5,363	5,743	6,086	4,856	5,255	5,652
10—15 "	4,897	5,415	5,913	4,580	5,021	5,527
15—20 "	4,687	4,986	5,220	4,605	4,899	5,087
20—25 "	4,609	4,426	3,978	4,791	4,677	4,025
25—35 "	7,923	7,452	6,561	8,188	7,884	6,833
35—45 "	5,846	5,678	5,238	6,187	5,973	5,827
45—55 "	4,110	4,035	4,303	4,304	4,226	4,515
Over 55 "	3,912	4,101	6,413	4,212	4,308	6,554
Total	47,266	47,953	49,839	47,218	47,945	49,730
<i>Females.</i>						
Under 5 years....	5,991	6,136	6,122	5,460	5,733	5,688
5—10 "	5,420	5,791	6,064	4,903	5,300	5,624
10—15 "	4,991	5,526	5,651	4,669	5,084	5,313
15—20 "	5,209	5,356	4,520	5,134	5,209	4,462
20—25 "	5,564	5,129	4,037	5,744	5,352	4,112
25—35 "	9,113	8,289	6,846	9,649	8,876	7,346
35—45 "	6,492	6,094	5,482	6,842	6,455	5,977
45—55 "	4,640	4,484	4,542	4,812	4,611	4,693
Over 55 "	5,314	5,242	6,877	5,569	5,435	7,095
Total	52,734	52,047	50,161	52,782	52,055	50,270

The examination of this table shows several facts of very considerable interest. Males are fewer in proportion in the urban districts than in the rural districts, and fewer in London than in the urban districts. A slight relative decrease in males was also shown in 1901 as compared with 1891, especially in the rural districts. The absence of troops in South Africa seems capable of explaining most of the change. For males at the years from 20 to 45, so far as the table shows, the urban districts generally, and London especially, show a relative excess over the rural districts. The excess was somewhat less in 1901 than in 1891, London showing a change slightly greater than the urban districts as a whole. For females the numbers in each age-period from 15 to 45 (in London to 55) show a relative excess for the urban districts over those for the rural districts. This excess was also less in 1901 than in 1891.

There was, however, a marked change between 1891 and 1901 in the proportion of juveniles to adults in all districts. In all, the proportion of children fell, and the fall was a little greater in London than in the urban districts, and in these again a little greater than in the rural districts. In each of the first three quinquennial age-periods the reduction was about the same in the rural districts, but in the urban districts and in London, the age-period 5-10 showed a drop greater than that of the period 0-5 or of the period 10-15.

In the relative numbers of the two sexes at the different ages there was also a notable change in the interval between the two censuses. In the three age-groups from 10 to 25, the relative excess of females shown in the urban districts in 1891 was reduced, and the relative deficiency in the rural districts was likewise reduced, while between 25 and 45 the relative excess in the urban districts was increased. In London the relative excess of females between 25 and 35 was increased, the movements in the proportions at other ages being not very significant.

For the purposes of this paper, the following tabular comparison of the age-distributions in towns of from 100,000 to 250,000 inhabitants in December, 1900, in Germany, and in April, 1901, in England, and also in towns having over 250,000 inhabitants at those dates, has been prepared. The German figures relate, not precisely to those between the ages 0-5, 5-10, &c., but to those whose ages at the date of the census were respectively under 4 years 11 months, between that age and 9 years 11 months, &c. It has not seemed necessary, for the purposes of such comparisons as are here proposed, to adjust the figures as recorded in this way to make them correspond precisely with the age-intervals adopted for the English figures. The differences to which it is desired to draw

attention are not so minute as to be annulled by the reduction to exact parallelism in the ages represented, even in the first of the periods.

Age distribution per 100,000 of both sexes, 1900-01.

Ages.*	9 towns of over 250,000 inhabitants.				24 towns of from 100,000 to 250,000 inhabitants.			
	England.		Germany.		England.		Germany.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
0—5.....	5,653	5,675	5,186	5,190	5,649	5,714	5,719	5,726
5—10.....	5,055	5,115	4,509	4,554	5,190	5,279	4,944	4,966
10—15.....	4,773	4,851	4,014	4,082	5,007	5,162	4,496	4,524
15—20.....	4,707	5,173	4,398	4,913	4,857	5,346	4,936	5,108
20—25.....	4,798	5,624	5,995	5,979	4,612	5,487	6,499	5,680
25—30.....	4,392	5,101	5,145	5,214	4,186	4,851	4,905	4,821
30—35.....	3,770	4,234	4,395	4,497	3,632	4,047	3,973	4,022
35—45.....	6,131	6,642	6,575	6,976	6,011	6,572	6,011	6,319
45—55.....	4,280	4,681	4,296	4,947	4,281	4,659	3,965	4,509
55—65.....	2,570	3,014	2,393	3,161	2,565	3,019	2,327	3,040
65 and over	1,141	2,240	1,281	2,300	1,616	2,258	1,330	2,180
Total	47,650	52,350	48,187	51,813	47,606	52,394	49,105	50,895

* In the case of Germany the limits of the periods are one month short of the full years named.

In comparing the sex-proportions for English and German towns, we observe that, so far as the groups of towns of under 250,000 inhabitants are concerned, the German towns contrast with the English in somewhat the same way as the English urban districts were shown in the preceding table to contrast with the English rural districts, with the important difference that, in the German towns, the males between 20 and 30 years of age were more numerous than the females at the same ages. In part, at any rate, this is due to the presence of young German conscripts in certain of the towns. Strassburg, Posen, Kiel, and Danzig had each more than 10 per cent. of their male population composed of soldiers on active service, while Cassel and Königsberg approached that proportion, and four or five others had from 5 per cent. upwards. Though the English list includes Portsmouth (and also Plymouth), the extra numbers in the years of early maturity are present in them from ordinary industrial reasons in the main. But it would be a mistake to imagine that the entire effect observed in the German towns is due to the cause here considered. In Germany, as a whole, about 2·3 per cent. of the male population were returned as on active military service. This proportion would account for as many as 43,000 in a male population of normal constitution equal to that

of this group of towns, whereas there were actually about 98,000 military present in them in 1900. Basing the comparison on the numbers between 16 and 30 only, the average proportion of military throughout the empire would yield about 53,000 in these towns. It may, perhaps, be sufficient to estimate that about 50,000 of the excess of young adult males in the towns of from 100,000 to 250,000 is due to the presence in them of a greater proportion of conscripts than would be provided by their own ordinary resident population, or about 1,300 per 100,000 of their total population. The male excess between 20 and 30 years of age is thus more than accounted for, but the deduction of these would not reduce the proportions of males to females at the ages devoted to military service to the level found in the English towns of corresponding size.

For the larger towns the 71,000 of military present represents an excess of 12,000 on the first basis of calculation, and of about 4,000 on the other. Only about 1 per cent., 100 per 100,000, of the total population, would probably be accountable for under this head, and here again the proportion of males other than military is seen to be far above the English level at the ages affected by military training.

The effect of the basing of the German figures on the calendar years within which the dates of birth fell, instead of on full years of life, is somewhat to over-represent all the age-periods except the first. At a rough estimate about 90 should be added to the figures in the youngest age-period in the towns of Group I, and a little over 100 in those of Group II for each sex to give figures reasonably comparable with those for the English towns. This adjustment would still leave the proportion of children at all ages in the largest towns far behind that of the corresponding English towns, while, though it would make the numbers under 5 years of age relatively greater in the other group of German towns than in English towns of similar size, it would exaggerate the rate at which the relative numbers fell off from period to period till the age of 15 is passed in the German towns. Before passing to the relations of the figures of ages to the records of births and deaths, it may be instructive to examine the age distribution in English towns of less than 100,000 population. For this purpose two groups have been taken—one comprising the towns of from 50,000 to 100,000 population, the other those between 20,000 to 50,000. In strictness these descriptions should be modified somewhat. The preceding tables dealt with the 33 great towns for which the Registrar-General formerly gave certain summary figures in the annual summaries and other reports. They include Swansea, Wolverhampton, Burnley, and Huddersfield, none of which quite reached the 100,000 level in 1901. On the

other hand, Southampton, which had a population in excess of that figure, was not included. In later annual summaries the figures for 76 large towns are dealt with, including not only boroughs, county and municipal, but also a number of urban districts which are not boroughs. The first of the groups now to be examined includes the 43 which are left when from these 76 towns of over 50,000 inhabitants the 33 great towns before dealt with are deducted. Their aggregate population at the Census was 3,138,768, and, besides Southampton, there are included Tottenham and Rhondda, each of which had more than 100,000 inhabitants in 1901.

The remaining group comprises boroughs and urban districts having between 20,000 and 50,000 inhabitants in 1901, which are dealt with separately in the Registrar-General's annual summaries. They were 141 in number, and their population numbered about 4,500,000.

The figures of the age-distribution of not a few towns in this fourth group present a notable contrast with those of the other groups, in the degree in which they bear the traces of immigration on an extensive scale and of recent date. The large number of these towns makes the aggregate result a blend of varying nature. The group includes both growing industrial towns, seaside resorts, and suburban districts, as well as towns to which none of these designations apply. The figures bear out the impression otherwise obtained in studying the changes of the last generation, that the towns in which growth by absorption shows exceptional vigour include a large number of those whose population lies between 20,000 and 50,000.

It may not be without interest, too, to show the figures for the towns in Group I without London, as the population of London exceeded 4,500,000, while that of the other eight was a little short of 3,500,000, or substantially the same as that of the 24 towns of Group II. In Germany, the population of Berlin was only about one-third of that of the group with which it has been included in our tables, so that its influence will be less dominant in the figures of the group than in the case of London and the eight largest English towns.

The towns of Group I, excluding London, present (see p. 222) a higher proportion of young children than the towns of Groups II or IV, but a smaller proportion than the towns of the third group. In the proportion of males to females there are like differences and similarities. The proportion of both sexes in the active years of life is high, but it is in these years that the excess of females in Group III is reduced in comparison with the other groups. For Group IV the same statement may be made, but with the sexes

changed. In every age-group from 10 to 65, the proportionate number of females is less in Group III than in Group II, and, in all of these age-groups except the first, less than in Group I with London omitted.

Age distribution per 100,000 of both sexes in towns in England and Wales, 1901.

Ages.	Populations exceeding 250,000 (excluding London).		Populations between 50,000 and 100,000.		Populations between 20,000 and 50,000.	
	Males.	Females.	Males.	Females.	Males.	Females.
0—5.....	5,901	5,958	6,065	6,069	5,513	5,549
5—10.....	5,318	5,395	5,489	5,522	5,200	5,254
10—15.....	5,028	5,092	5,116	5,180	5,034	5,140
15—20.....	4,841	5,225	4,923	5,076	4,969	5,390
20—25.....	4,778	5,467	4,751	5,140	4,657	5,450
25—30.....	4,397	4,873	4,403	4,693	4,103	4,852
30—35.....	3,733	4,045	3,783	3,967	3,539	4,083
35—45.....	6,056	6,378	5,994	6,151	5,855	6,584
45—55.....	4,248	4,507	4,127	4,256	4,139	4,724
55—65.....	2,508	2,894	2,399	2,730	2,565	3,172
65 and over....	1,412	1,946	1,472	2,694	1,723	2,505
Total	48,220	51,780	48,522	51,478	47,297	52,703

The results are shown graphically in the diagrams at the end of the paper. These diagrams show the percentage excess or defect of the numbers per 100,000 in each age- and sex-group compared with the corresponding numbers for England and Wales as a whole. The German town-groups are similarly compared with the German Empire. The contrasts between the different groups are more readily appreciated, perhaps, from the diagrams than from the tables which they embody. (See pp. 240 and 241.)

Viewing these tables and diagrams in relation to the previous study of migration into large towns in Germany, it may be pretty safely asserted that the English towns are absorbing population from outside, *i.e.*, from the rural districts and small towns, much less rapidly than the German towns of corresponding size. The period when growing towns had a relatively large rural population to draw from has passed in England, while, in spite of the growing urbanisation of Germany, there yet remains a relatively large rural population, by the absorption of which, or of the natural increase at least, the towns may maintain a high rate of growth. This rate of absorption must, however, decline in time, unless actual depopulation of the rural districts should occur, for the mass of urban residents to which addition is to be made is increasing, while the rural mass from which absorption may take place is stationary.

But the growth of these communities depends not only on the extension of their areas and the net indraught from the country, but also on their natural increase by excess of births over deaths. It is commonly believed that this source of increase affords a larger surplus in Germany than in England, and a brief examination of this point is desirable to determine the dependence of growth on immigration. For Germany as a whole, it is true that the birth-rate, and the excess of birth-rate over death-rate, is greater than in England, though the difference, after increasing for a while, has diminished in recent years.

In the ten years 1899-1908, the birth-rate averaged 34·0 per thousand of the population in Germany, and 27·8 in England and Wales. In the first five years of the period, the figures were 35·2 and 28·7, in the second five years, 32·8 and 27·0. The death-rate for the ten years averaged 19·7 per thousand of the population in Germany, and 16·1 in England and Wales. In the first five years the figures were 20·5 and 17·0, and in the second five years 18·7 and 15·3. Thus the birth-rate has decreased in greater proportion in Germany than in England, while the death-rate has decreased somewhat less rapidly there than here. As a result the rate of natural increase has decreased from 14·7 to 14·1 in Germany, while it has remained at 11·7 in England and Wales. Even if it should be granted that the population of this country is somewhat over-estimated for the later years, while the quinquennial census has imposed a check on inaccuracy in the estimate in Germany, the difference so caused can hardly be great enough to offset the diminished survival-rate in Germany.

If we should inquire as to the causes of the change in Germany, one of the answers that might be suggested is the increase in the proportion of the urban population to the total. It will be found that the conditions in the great towns are conducive to a lower rate of natural increase than that in the country at large in Germany, while in England the contrast is at most very slight, a result that might be attributed, in part, to the fact that the average conditions here are more dominated by urban life than is the case there at present.

It was noted by Dr. Stevenson and Dr. Newsholme, in their paper read before this Society in December, 1905, that the factors which tend to a reduced birth-rate have operated as yet only in the towns in Germany. But, before passing to the examination of some evidence bearing on this problem of urban comparisons, it may not be unprofitable to glance at the general trend of the life tables which have been prepared, and which refer to the same period in the two countries, namely, the period 1891-1900 in each case. The

latest Decennial Supplement of our Registrar-General provides the English life table, the recently issued "*Deutsche Sterbetafel*n" the German table. The following is a comparison of some figures which will give a general idea of the relations of the two tables:—

Life-tables compared, 1891-1900.

Age.	Males.				Females.			
	Survivals of 100,000 births.		Mean after lifetime (years).		Survivals of 100,000 births.		Mean after lifetime (years).	
	England.	Germany.	England.	Germany.	England.	Germany.	England.	Germany.
0	100,000	100,000	44·13	40·56	100,000	100,000	47·77	43·97
1	82,814	76,614	52·22	51·85	85,934	80,138	54·53	53·78
5	75,028	69,194	53·50	53·27	78,214	72,623	55·79	55·22
10	73,430	67,369	49·63	49·66	76,527	70,646	51·97	51·71
15	72,537	66,462	45·21	45·31	75,550	69,562	47·61	47·47
20	71,171	65,049	41·23	41·23	74,177	68,201	43·44	43·37
25	69,389	63,168	37·01	37·38	72,539	66,467	39·37	39·43
30	67,320	61,274	33·07	33·46	70,582	64,385	35·39	35·62
40	61,596	56,402	25·64	25·89	65,301	59,467	27·82	28·14
50	53,089	49,002	18·90	19·00	58,032	53,768	20·64	20·58
60	40,952	38,308	12·93	12·82	47,304	44,814	14·10	13·60
70	24,663	23,195	8·05	7·76	30,917	28,917	8·78	8·10

The most notable feature of the comparison between the tables for England and Germany is, perhaps, the difference in the mortality in the first year of life.² The figures cited for ages 10 to 50 for males, and for ages 25 to 40 for females, show somewhat more favourable conditions in Germany than in England for persons in the prime of life, not unconnected with the greater proportion of rural population, it may be surmised. But the death, before reaching the age of 1, of 234 male infants of each thousand born in

² To enable the general features of the comparison of these life-tables to be grasped readily, so far as they relate to ages other than those of infancy and senility, a diagram is given on the model of those annexed to the German report on these life-tables. The diagram is drawn to show the variation with age of the number living for each death. This number is taken as the measure of "*Lebenskraft*" in the German report, a word which is rendered "*vitality*" on the diagram. The curves for Berlin, as well as those for England and Wales and for Germany, are reproduced. The fact that the irregularity shown in the vitality line for males in the German Empire at about the ages 20—25 is not shown for Berlin or for England is assigned by the author of the report to differences in vital conditions as between town and country. The diagram has thus an apparent special relation to our subject. It should be added that the diagram has been drawn, not from the figures for five-year groups used in the German report, but from the data for the individual years, both around the peaks and elsewhere, where close examination appeared to be desirable.

Germany as compared with 172 in England, and of 199 female infants there compared with 141 here, goes far to diminish the effect of the higher birth-rate there. To counterbalance the loss in this first year, the birth-rate in Germany would need to be 29.9 to correspond with 27.8 in England. Considering the number reaching the age 20, a birth-rate of 30.3 in Germany would be required to yield the same number attaining their twentieth year in equal populations as would be yielded by the birth-rate of 27.8 in England, under the conditions of the decade 1891-1900. Well on to 40 per cent. of the apparent advantage in birth-rate would be, under these conditions, lost before the age of complete self-dependent production was reached.

The same thing may be illustrated in another way, which combines the effects of conditions affecting vitality with the results of emigration, which latter has been greater from this country than from Germany, even if we consider England and Wales alone, thus eliminating the Irish emigration, the inclusion of which has, in the past at any rate, swollen the totals for the United Kingdom. The numbers enumerated in 1900 and 1901 and born during the preceding 15 years were as follows:—

Age at Census.*	England and Wales, 1901.			German Empire, 1900.		
	Number enumerated.	Births in corresponding period.	Surviving per 100,000 births.	Number enumerated.	Births in corresponding period.	Surviving per 100,000 births.
0—5.....	3,716,708	4,624,368	80,372	7,259,473	9,624,954	75,423
5—10	3,487,291	4,532,805	76,934	6,408,642	9,220,341	69,505
10—15.....	3,341,740	4,424,643	75,526	5,853,249	8,796,440	66,541

* One month less in the case of Germany.

Here again we have the expression of the fact that, from a given number born, far fewer outlive childhood in Germany than in England. The life-table shows that close to 30 per cent. die within five years of birth in Germany, while 25 years are required in England to bring about the same reduction. The productive effort resulting from a thousand births is much greater here than there, the waste of life and of nurturing care much less.

Let us see how far the data relating to the large towns suggest that they are likely by their growth to add to this discount on the superiority in birth-rate hitherto maintained in Germany.

For the purpose of presenting some evidence bearing on this subject, I have desired to adhere to the grouping of towns of large

and of lesser size adopted in the earlier part of this paper. This has limited the selection of periods for comparison on account of the way in which the data presented for English towns in the reports of the Registrar-General have varied from time to time as opportunity for their extension has been found. The figures are taken from the Registrar-General's Annual Summary for each year. For London and four groups of English towns the average results have been as follows, commencing with the year 1902:—

*English towns, 1902-08.**

Groups.	Approximate mean population.	Average number of births per annum.	Birth-rate.	Average number of deaths per annum.	Crude death-rate.	Average deaths under 1 year.	Infantile death-rate.
London	4,680,000	126,980	27·13	73,217	15·64	16,547	130
8 towns over 250,000.	3,740,000	109,931	29·19	65,262	17·45	16,891	154
24 other great towns	3,700,000	103,447	27·96	60,694	16·40	15,124	146
43 towns over 50,000	3,480,000	101,736	29·24	51,841	14·90	13,952	137
141 towns over } 20,000†	4,725,000	127,744	27·04	70,088	14·83	17,136	134

* December 29, 1901, to January 2, 1909.

† In the first two years only 103 towns were recorded, and the figures for those years have been weighted accordingly.

The corresponding record for German towns in the same period may be put in comparison with this. It is as follows:—

German towns, 1902-08.

Groups.	Approximate mean population.	Average number of births per annum.	Birth-rate.	Average number of deaths per annum.	Crude death-rate.	Average deaths under 1 year.	Infantile death-rate.
Berlin	2,020,000	49,493	24·50	32,556	16·12	9,141	185
8 towns over 250,000	3,830,000	114,463	29·89	68,809	17·97	22,634	198
24 other great towns	4,220,000	136,142	32·26	76,452	18·12	25,378	186
53 towns over 50,000	4,080,000	131,795	32·30	71,979	17·64	24,900	189
All other towns } over 15,000	6,230,000	196,389	31·52	113,971	18·31	36,856	188

These figures cover roughly three-fifths of the population of England and Wales, and a third of that of Germany. In their crude shape they present some suggestive contrasts. The one is that, in England, the larger towns, with the exception of London, show higher birth-rates than the country at large, while in Germany the

towns show lower birth-rates than the country at large. The higher figure for the English towns is readily intelligible in view of the transfer of a substantial number at the reproductive ages from without to within the towns here considered. But we have seen that in Germany the transfer is even greater, and were the true birth-rate maintained even as high in German as in English towns, the apparent rate would be higher there than here.

The actual proportion of married women in the female population over 15 years of age in England and Wales in 1901 was 496 per thousand. In London it was only 463 per thousand, and in the other towns of Group I, 504 per thousand, and in those of Group II, 490 per thousand. Otherwise, 17·5 per cent. of the total population of London consisted of married women, 17·8 per cent. of the population of the other towns of Group I, and 17·7 per cent. of the population of Group II, the figure for the country at large being 17·6 per cent. The proportions of the birth-rates would clearly not be greatly modified if the births were expressed in proportion to the number of married women. If taken in relation to married women between 15 and 55, who formed 15·4 per cent. of the population of London, 15·7 per cent. in the other towns of Group I, 15·5 per cent. in Group II, and 15·0 per cent. in the country at large, the case is somewhat, but not very markedly, modified. It appears as if to yield the same proportion of births to married women between 15 and 55 as was found in England and Wales as a whole (birth-rate 1902-08, 27·44); London's birth-rate should have been 1·07 higher than it actually was. The other towns in Group I actually had a birth-rate higher by 0·37 than would yield the result in question, while Group II fell short by 0·40. These differences are less than one was prepared to find, in view of general opinion on the subject.

In the German towns, the proportion of married women to all women over 15 was, in 1900, 472 per thousand for Berlin, 469 per thousand for Group I as a whole, 486 per thousand for Group II, and, for Germany as a whole, 520 per thousand. Married women formed 17·4 per cent. of the population of Germany, 17·8 per cent. in Group I and 17·3 per cent. in Group II. Women between 15 and 55 formed 27·23 per cent. of the population of Germany, 32·51 per cent. in Group I and 30·46 per cent. in Group II. I am unable to state the proportions of married women between 15 and 55, but, in view of the considerable proportion of illegitimate births in German towns (18·3 per cent. of all births in Group I and 11·5 per cent. in Group II in 1908), the figure would have much less applicability in measuring the possible birth-rate than in the cases in which it has been used above.

		Children under 15 years of age per 100,000 of the population.	Women between 15 and 55 per 100,000 of the population.	Birth-rate, 1902-08.
Towns over 250,000.....	{ England Germany....	31,097 27,535	31,455 32,526	28·1 28 0
Towns between 100,000 and 250,000	{ England Germany....	32,001 30,375	30,962 30,459	28 0 32 3
The entire country	{ England Germany....	32,420 31,798	29,596 27,232	27·4 33·3

In the last line of this table the figures for Germany, like those for England, apply to completed years of life. As already explained, other figures for German age-groups apply to periods terminating one month short of full years of life, the census-date being December 1. The proportion of children under 15 years of age is therefore somewhat understated for the town groups. The extent of the understatement may perhaps be estimated from the fact that the corresponding figure for Germany as a whole was 34,632, in place of the 34,798 stated in the table. A correction, to bring the German figures into parallelism with the English would, apparently, do little to modify the contrasts of the table.

In spite of the differences in the general age-distributions already shown, the proportion of women at ages 15 to 55 is substantially the same in the German and English towns of the second rank in magnitude. The higher birth-rate in these German towns would, but for migration, yield a larger proportion of children than in the English towns, in spite of the higher rate of infantile mortality. It must, therefore, be presumed, not so much that the proportion of married in the immigrant population is markedly below that of the town population as a whole, but that the proportion of children is lower in the immigrant families than that which would be yielded by the birth-rate and proportionate mortality under the conditions of steady residence in the towns.

Turning now to the death-rates, in each group of English towns represented in our table, except in London, the deaths under 1 year of age represent about one-fourth of all the deaths recorded. In London they are notably less than one-fourth. In the German towns the rough proportion of one-third more nearly represents the position, Berlin, like London, showing a smaller proportion than the other towns.

Apart from these deaths in infancy, therefore, the crude death-rates in the German towns are lower than in the English towns, but

we have seen that in the German towns the young adults of both sexes are more numerous than in the English towns, relative to the total population, and this should tend to a lower crude death-rate where the young adults are most numerous.

To calculate the death-rates in standard population would require a knowledge of the deaths at the various ages, which I am unable to supply for the English towns, and which would involve a very long process of tabulation for the German towns. To provide an approximation to the result, however, as the age-grouping of the population is known, I have calculated the death-rates which would have been produced in such populations had the average death-rates prevailing in England and Wales for each age and sex-group in 1891-1900 obtained, following the method used, in similar circumstances, by the Registrar-General in his Annual Summary.

From this "death-rate with standard mortality" we may, by comparison with the average rate for England and Wales for 1891-1900, the period to which the standard mortality relates, measure the effects of the deviations from the standard age and sex distribution of the population. The ratio of the death-rate for England and Wales in 1891-1900 to the "death-rate with standard mortality" in the towns or groups of towns considered will, in fact, yield a correcting factor for the crude death-rates of those towns or groups of towns.³

As an example, if we take the figures for London given in the last Decennial Supplement of the Registrar-General, the crude death-rates for the decennium 1891-1900 were 20.87 for males and 17.70 for females. The death-rates with standard mortality work out at 18.41 and 16.35 respectively, and, applying the correcting factors obtained as above, the indices of mortality resulting are 21.90 and 18.56 respectively. The death-rates in standard populations given by the Registrar-General are 21.82 and 18.49.

³ A few words may be added in reference to the relation between the mortality index used above, and the death-rate in standard population commonly used as a corrected index of mortality. The latter applies a direct correction for abnormality of age constitution, the former an indirect correction. If the proportions of the death-rates in the town groups dealt with, and in the population taken as standard of reference, were the same in each age-group, the two modes of computation would give identical results. In fact, such parallelism does not exist, but there appears to be a good deal of compensatory variation, judging by the results of applying the two methods to certain sample cases. The object being to determine a factor of correction which will express the effect of differences of age-and-sex constitution of different populations, the one method might be claimed to give a measure of this difference equally worthy of consideration with that given by the other, though having the disadvantage of less simple description.

The results of the corresponding calculations for London and the two groups of great towns in England and Germany are stated in the table below. It will be seen that the death-rates calculated on the urban population distributions of 1900 or 1901 at the rates taken as standard for each age and sex-group, are higher than the crude death-rates for the English towns, lower for the German groups. The mortality of the English town groups in 1902-08 was thus below the level prevailing in England and Wales in 1891-1900 (18·19 per thousand per annum), while for the German groups it was above that level. The mortality index for both German town groups works out about 19, while for the English groups the index is below 17·5.

Average death-rates, 1902-08.

	Crude death-rates.	Death-rates, with standard mortality.	Corrected mortality index.
London	15·64	17·32	16·42
9 towns of Group I—			
England and Wales	16·45	17·18	17·42
Germany	17·33	16·63	18·95
24 towns of Group II—			
England and Wales	16·40	17·25	17·29
Germany	18·12	16·88	19·52

The application of the factor of correction increases the differences between the rates in the two countries owing to the greater concentration of young adults in the German towns than in the English towns of corresponding size.

The differences of infant mortality are reflected in the figures of the last column as well as in those of the first column. If the deaths under 1 year of age be excluded, and a corrected mortality index be calculated for the remainder of the mortality by the same procedure as that used for the total mortality, the results yield, for deaths of individuals over 1 year of age, a mortality index of 13·27 for the aggregate of Group I and 13·04 for Group II in England and Wales, the corresponding figures for German towns being 12·83 for Group I and 13·22 for Group II. Substantially, therefore, the mortality at ages beyond infancy may be said to be equal in measure in the English and German towns, since the process of arriving at these figures yields results which I should not care to describe as other than approximate. Further, the consideration that the populations, and therefore the crude death-rates and everything derived from those rates, are known only approximately for the years considered, would alone prevent any attempt to press the results so as to assign significance to

fractional variations in the figures. Thus the effects of the conditions of life on that part of the population which survives early infancy would not appear to be such as to leave any marked result in differences of mortality, when reduced to the same standard of measurement, between English and German cities.

In view of the position which was shown in Part I of the latest Decennial Supplement issued by the Registrar-General, it may be of interest to note the apparently remarkable improvement which has recently taken place in the matter of infantile mortality in great towns. It appeared that the decennium, 1891-1900, showed a startling reversion to the high figures of a relatively distant past. Unless the figures of the annual summaries, which do not appear to have been fully revised subsequent to their issue in the quarterly reports, are in defect of the true totals by incredible amounts, this reversion has already yielded place to a very satisfactory degree of progress in our English towns. This would, at any rate, appear to be indicated by the figures presented in the following table for a period of seven years preceding that to which the table of births and deaths given above (p. 226) relates.

English towns, 1895-1901.

Group.	Approximate mean population.	Average number of births per annum.	Birth-rate.	Average number of deaths per annum.	Crude death-rate.	Average deaths under 1 year.	Infantile death-rate.
London	4,505,000	132,690	29.45	84,421	18.74	21,467	162
Rest of Group I	3,233,000	103,937	31.56	67,972	20.64	17,830	172
Group II	3,420,000	101,435	29.66	64,403	18.83	18,470	182

The comparison of these figures with those of the earlier table for the seven years, 1902-08, shows a most gratifying reduction of the death-rate, infantile and other, in the interval, and, in spite of a reduction in the birth-rate, the reduction in the death-rate has been greater absolutely, as well as relatively. The increase of population has yielded only a trifling increase in the total number of births in these 33 towns, but the deaths under 1 year of age have decreased in number by over 9,000 per annum, or about 16 per cent., and the deaths at all ages by over 17,000, which leaves, after deduction of deaths of infants, a reduction of 5 per cent. in deaths above 1 year of age.

It may be added, although it is not proposed to delay to present the statistical data, that, in the larger German towns at any rate, the interval here considered has also produced changes similar to those here noted for England (*c.f.* Tables pp. 237-238).

Summary of conclusions.

It has been shown that the process of urbanisation is going on with even greater speed in Germany than in England.

The growth of towns by migration being traced in certain features from the returns of the German census, it was found that practically the entire natural increase of German population for a quarter of a century has drifted into the towns (or, in the earlier part of the period at any rate, migrated across the ocean).

More than half the population of the towns of over 100,000 population in Germany in 1900 had been born elsewhere than in the town where they were enumerated, while about one-fifth of those who, having been born in the great towns, survived in 1900, were living outside the limits of the great towns, probably to a great extent in the suburban areas near them.

The drift to the towns being mainly a movement of young adults, results in an abnormal proportion of persons between 20 and 45 in urban areas, and the presence of this abnormal proportion in English towns affords evidence both of their absorptive capacity and also, in its comparison with the corresponding figures for German towns, of the fact that immigration into towns on a large scale is a phenomenon of older date in this country than in Germany.

Turning to the effect of the aggregation in towns of an exceptional proportion of young adults, the comparison between German and English conditions was prefaced by an examination of life-tables for the two countries. From these it appears that the first five years of life in Germany are as effective in reducing the numbers born as the first twenty-five years in England. Owing to this, the higher birth-rate there contributes to increase of the working population much less than in its proportion to the birth-rate in England.

The birth-rate in the larger English towns (London excepted), owing to the concentration there of those who are contributing to the increase of population, is higher than in the country at large, while the large German towns, in spite of an even greater concentration in them of persons at the ages referred to, nevertheless present lower birth-rates than the Empire at large.

In England the death-rate in certain groups of towns exceeds that for the country at large, while in German towns the presence of an exceptional proportion at the period of life when mortality is slight suffices to keep the crude death-rate below that for the Empire.

In both countries the infantile death-rate in towns of over 250,000 inhabitants is in excess of that in smaller towns, and the

infantile death-rate in English towns is about 25 to 30 per cent. below that in German towns of equal size.

By calculating the death-rates resulting from the age distributions, supposing the mortality at each age equal to that in England and Wales in 1891-1900, it is shown that, not only are the crude death-rates in the towns higher in Germany than in England, but the actual mortality in the German towns is severer than in the English towns, though this appears to be due to the higher infantile mortality, rather than to any greater mortality among adults.

A result of considerable interest, arising out of the conditions subjected to statistical examination in this paper, is that, in spite of the impression produced by the excess of the German birth-rate over the English, the average number of children per family in German towns is less than in English towns of corresponding size, and notably so in the largest towns, the average birth-rate of which is substantially the same in England and Germany.

Comparisons between the recent period, the statistics of which have been used throughout the principal part of the paper, and a period of equal length immediately preceding it, show that the unfavourable tendencies of the infantile death-rate in English towns, noted as manifested in the nineties, have yielded place to better conditions.

Note added subsequent to the Meeting.

In reference to the question, raised in the discussion, of the possible effect of differences in methods of registration in England and Germany, especially as affecting the classification of births as "living" or "still" births, the following statement may serve to throw some light on the question.

Survivals from 100,000 births.

	England and Wales.		Germany.
	1891-1900.	1905.	1891-1900.
At 1 month	(95,355)	95,861	93,402
„ 3 months	92,602	93,401	88,486
„ 12 „	84,667	87,295	78,330

The English figures for 1891-1900, given in the last Decennial Supplement (p. cvi), do not include a figure for months intermediate between birth and 3 months, or 3 months and 6 months. The figure in italics stated above has been estimated by interpolation, guided

by the sequence of figures for 1905, which are given month by month. The preceding table yields the following:—

Deaths before reaching 1 year of age per 1,000 living.

	England and Wales.		Germany.
	1891-1900.	1905.	1891-1900.
At birth	153	128	217
„ 1 month	(112)	89	161
„ 3 months	86	65	115

Thus the figures for England and Wales in 1905, for deaths from ages 1 month or 3 months to the end of the first year of life, must be increased by about 80 per cent. to yield the German figure for 1891-1900, while the figure for the entire year must be increased by 70 per cent. only.

The figures for England and Wales for the mortality from birth, or (as estimated) from age 1 month, to the end of the first year of life must be increased by 42 and 43 per cent. respectively to yield the German figures, while that for mortality from age 3 months to the end of the first year must be increased by 34 per cent.

These figures do not suggest that the practice in regard to distinguishing between living births and still births differs in England and Germany in a degree likely to affect the validity of the comparisons of infantile death rates made in the paper.

Population of great towns in England and Wales by age-groups. MALES.

Towns.	Total male population in 1901.	0-5.	5-10.	10-15.	15-20.	20-25.	25-30.	30-35.	35-40.	40-45.	45-50.	50-55.	55-60.	60-65.
London	2,142,085	247,913	220,257	207,770	208,921	217,350	199,120	172,298	150,706	129,992	107,320	87,913	65,784	52,932
Birmingham	252,084	31,165	27,266	26,126	25,922	26,407	23,181	19,191	16,870	14,182	11,853	9,747	6,986	5,532
Bradford	130,092	13,518	13,177	12,836	13,308	12,932	12,018	10,353	9,409	8,013	7,002	5,597	4,387	3,404
Bristol	151,754	18,294	17,988	17,487	18,754	18,871	12,653	11,059	9,771	7,821	6,822	5,368	4,576	3,670
Leeds	206,065	24,993	20,996	20,996	20,316	20,404	18,941	16,415	14,405	12,001	10,434	8,292	6,378	4,892
Liverpool	320,557	41,611	36,727	32,528	32,557	29,481	29,813	25,185	22,150	19,525	16,882	13,206	9,571	8,288
Manchester	265,297	31,881	28,327	27,446	26,533	27,047	25,129	21,010	18,199	15,734	12,722	10,359	7,151	5,589
Sheffield	189,805	23,118	20,711	18,273	18,922	19,958	18,061	14,928	12,950	10,755	9,259	7,555	5,570	4,150
West Ham	133,498	18,224	16,391	15,068	13,186	12,322	11,315	10,164	8,673	7,497	6,315	4,925	3,537	2,537
Totals of Group I	3,799,335	450,717	403,974	380,564	375,350	382,549	350,231	300,603	263,133	225,720	187,709	153,522	113,950	90,994
Birkenhead	54,077	6,470	5,817	5,711	5,585	5,706	5,029	4,119	3,511	2,993	2,473	2,120	1,598	1,331
Blackburn	58,966	6,922	6,316	6,553	6,259	5,632	5,009	4,405	4,153	3,657	3,052	2,349	1,701	1,468
Bolton	79,150	9,318	8,598	8,571	8,207	7,714	7,181	6,235	5,339	4,733	4,038	3,137	2,231	1,665
Brighton	54,210	5,792	5,597	5,652	5,430	4,807	4,379	3,908	3,781	3,309	2,840	2,403	1,844	1,607
Burnley	45,374	5,409	5,041	4,869	4,519	4,177	3,908	3,501	3,216	2,831	2,373	1,863	1,387	1,055
Cardiff	81,605	10,207	9,474	8,483	7,846	7,643	7,410	6,027	5,975	5,036	3,866	3,051	2,197	1,617
Croydon	60,087	7,027	6,816	6,248	5,943	5,524	4,947	4,574	4,159	3,567	2,857	2,496	1,857	1,565
Derby	51,387	5,740	5,488	5,250	5,211	5,048	4,417	3,967	3,450	3,096	2,801	2,205	1,669	1,187
Gateshead	56,371	7,550	6,827	6,119	5,686	5,229	4,806	4,019	3,538	3,004	2,549	2,142	1,512	1,136
Halifax	48,467	4,911	4,700	4,704	4,424	4,408	4,407	4,012	3,398	3,136	2,669	2,187	1,605	1,246
Huddersfield	43,765	4,583	3,781	3,884	4,286	4,519	4,160	3,726	3,274	2,912	2,451	1,904	1,455	1,241
Hull	117,453	15,124	13,305	12,704	11,444	11,039	10,111	8,874	7,518	6,404	5,445	4,770	3,574	2,491
Lancaster	99,014	12,049	10,716	10,290	9,990	9,719	8,737	7,621	6,763	5,925	4,819	3,945	2,850	2,194
Newcastle-on-Tyne	106,863	13,052	11,623	10,991	10,809	11,233	10,159	8,151	7,022	5,967	5,114	4,189	3,214	2,332
Norwich	51,065	6,224	5,801	5,827	5,339	4,223	3,730	3,481	3,169	3,018	2,430	2,110	1,622	1,305
Nottingham	111,695	12,778	11,010	11,063	11,738	10,467	9,354	7,960	7,447	6,890	5,914	4,691	3,417	2,888
Oldham	65,275	6,492	6,437	6,617	6,808	6,578	5,944	5,397	4,742	4,069	3,452	2,770	1,969	1,506
Plymouth	50,535	5,571	5,233	5,000	5,076	4,934	4,516	3,900	3,479	2,972	2,404	1,951	1,607	1,365
Portsmouth	91,014	9,362	9,008	9,008	9,780	9,750	8,213	6,947	5,956	5,180	4,311	3,505	2,863	2,479
Preston	51,686	6,240	5,940	5,792	5,339	4,781	4,377	3,892	3,496	2,993	2,504	1,983	1,544	1,228
Salford	106,792	13,173	11,903	11,352	10,824	10,788	9,942	8,477	7,241	6,106	5,202	4,109	2,889	2,203
Sunderland	71,563	9,062	8,319	7,902	7,519	6,650	6,091	4,989	4,555	3,615	3,003	2,418	1,842	1,616
Swansea	46,156	5,227	4,782	4,782	4,294	4,091	3,477	3,102	2,582	2,319	1,982	1,582	1,301	1,113
Wolverhampton ..	46,313	5,626	5,168	4,962	4,748	4,516	3,914	3,425	3,085	2,586	2,229	1,775	1,355	1,071
Totals of Group II	1,647,959	195,546	179,674	173,327	168,122	159,659	144,915	125,723	111,413	95,671	81,818	66,355	49,496	39,297

Population of great towns in England and Wales, by age groups. FEMALE.

Towns.	Total female population in 1901.	0—5.	5—10.	10—15.	15—20.	20—25.	25—30.	30—35.	35—40.	40—45.	45—50.	50—55.	55—60.	60—65.
London	2,394,456	247,695	222,363	211,816	232,912	260,566	239,209	198,554	168,882	141,486	119,010	99,284	75,821	65,153
Birmingham	270,120	31,677	27,928	26,294	28,305	29,351	28,729	20,556	17,144	14,639	12,474	10,352	7,958	6,692
Bradford	149,075	13,382	13,262	13,216	15,091	16,388	14,621	12,353	10,387	9,467	8,369	6,684	5,240	4,574
Bradford	177,191	18,136	18,030	17,736	18,559	18,706	15,463	13,406	11,412	9,571	8,369	7,000	5,742	4,876
Leeds	222,903	25,151	22,732	22,034	22,274	22,341	21,426	17,987	15,289	12,651	10,779	8,697	6,794	5,691
Liverpool	354,293	42,073	37,126	34,653	34,933	36,963	33,664	27,616	23,856	20,061	16,411	14,038	10,578	9,391
Manchester	280,575	32,194	28,751	27,307	30,394	30,394	27,019	22,282	19,061	16,116	13,499	11,289	8,362	6,906
Sheffield	190,988	23,508	21,152	18,734	19,527	19,439	17,592	14,595	12,385	10,349	8,492	7,282	5,762	4,840
West Ham	132,860	18,119	16,427	15,035	12,725	12,554	11,681	10,484	8,665	7,406	6,145	4,800	3,463	2,853
Totals of Group I	4,174,661	452,465	497,801	386,825	412,477	448,446	406,794	337,563	287,524	242,048	203,823	169,374	139,690	110,749
Birkenhead	56,838	6,660	5,713	5,543	5,613	6,057	5,447	4,389	3,855	3,165	2,621	2,282	1,682	1,472
Blackburn	68,660	6,695	6,602	7,079	7,267	7,222	6,345	5,384	4,389	4,353	3,494	2,881	2,198	1,754
Bolton	89,065	9,689	8,915	8,969	9,051	9,583	8,491	7,004	6,113	5,326	4,422	3,567	2,748	2,262
Brighton	69,368	5,960	5,724	5,872	6,826	7,211	6,463	5,666	4,943	4,251	3,801	3,247	2,587	2,386
Burnley	51,669	5,496	5,284	5,162	5,410	5,450	4,808	4,088	3,630	3,169	2,594	2,138	1,558	1,296
Cardiff	82,728	10,501	9,461	8,530	8,379	8,621	7,629	6,483	5,713	4,509	3,500	2,899	2,139	1,688
Croydon	73,808	7,054	6,850	7,331	7,883	7,883	6,983	6,064	5,122	4,407	3,708	3,107	2,449	2,087
Derby	54,525	5,665	5,598	5,530	5,747	5,811	4,970	4,011	3,529	3,200	2,724	2,234	1,745	1,373
Gateshead	51,517	7,420	6,566	6,044	5,457	5,197	4,883	4,030	3,395	2,896	2,315	1,914	1,462	1,140
Hallifax	56,469	4,922	4,868	5,010	5,469	5,532	4,564	4,041	3,577	3,244	2,556	2,134	1,794	1,414
Huddersfield	51,281	4,757	3,978	4,152	5,111	5,553	5,146	4,389	3,831	3,435	2,821	2,314	1,832	1,600
Hull	122,806	15,176	13,541	12,532	12,124	12,424	11,056	9,199	7,759	6,586	5,728	4,691	3,576	3,186
Leicester	112,565	12,217	11,157	11,141	12,234	12,356	10,707	8,686	7,335	6,370	5,286	4,465	3,326	2,730
Newcastle-on-Tyne	108,465	13,099	11,281	10,865	11,141	12,067	10,327	8,429	6,912	5,733	4,788	4,105	3,119	2,585
Norwich	60,668	6,481	6,055	6,128	6,467	5,927	4,916	4,265	3,803	3,310	2,870	2,526	1,982	1,750
Nottingham	125,048	12,714	12,209	12,314	14,061	13,758	11,491	9,652	9,002	7,747	6,528	5,169	4,141	3,412
Oldham	71,971	7,074	6,847	7,080	7,345	7,495	6,755	5,720	5,174	4,515	3,912	3,050	2,370	1,972
Plymouth	57,101	5,684	5,417	5,069	5,443	5,790	5,305	4,485	3,936	3,249	2,723	2,461	2,045	1,814
Portsmouth	97,064	9,947	9,356	9,423	9,185	9,671	8,964	7,927	6,715	5,841	4,803	4,124	3,322	2,766
Preston	61,303	6,406	6,314	6,038	6,241	6,322	5,747	4,957	4,198	3,647	3,081	2,565	2,076	1,751
Salford	111,165	13,409	12,075	11,412	11,591	12,115	10,919	8,882	7,513	6,566	5,302	4,484	3,330	2,687
Sunderland	74,494	9,551	8,346	7,902	7,566	7,524	6,367	5,222	4,617	3,857	3,353	2,704	2,159	1,760
Swansea	48,381	5,414	5,058	5,058	5,058	5,168	4,258	3,553	3,113	2,461	2,236	1,804	1,400	1,124
Wolverhampton	47,874	5,729	5,086	5,082	4,999	4,715	4,184	3,483	3,049	2,714	2,234	1,807	1,330	1,280
Totals of Group II	1,813,733	197,790	182,748	178,703	183,481	189,928	167,926	140,112	122,567	105,124	88,268	73,091	56,719	47,799

Population of great towns in Germany, by age-groups.* MALES.

Average for 1895-1904.†	Towns.	Total male popula- tion in 1900.	0-5	5-10	10-15.	15-20.	20-25.	25-30.	30-35.	35-40.	40-45.	45-50.	50-55.	55-60.	60-65.
17-66	Berlin	903,041	87,480	79,080	73,601	79,016	114,719	98,723	85,692	72,071	57,136	46,440	37,982	27,616	19,020
24-97	Breslau	193,813	22,999	20,091	18,201	19,220	22,219	18,497	15,618	13,067	11,340	8,845	7,451	5,455	4,188
21-72	Cöln	181,433	22,305	18,076	15,797	17,122	22,515	18,072	15,648	13,225	10,792	8,293	6,907	5,037	3,429
18-66	Dresden	180,639	20,530	16,850	15,388	17,278	28,609	21,310	16,657	13,227	10,651	9,126	8,453	6,489	3,561
16-93	Frankfurt a/M	139,652	15,172	12,420	10,338	14,134	17,117	16,038	13,203	9,952	8,112	6,850	5,729	4,214	2,840
17-97	Hamburg	333,987	40,812	37,060	30,655	29,638	31,168	32,433	32,062	27,684	22,423	18,041	14,006	10,874	7,528
19-91	Leipzig	222,716	25,008	22,429	22,306	22,386	27,655	22,868	18,851	16,089	13,259	10,442	8,066	6,606	5,833
22-70	München	243,777	29,777	20,486	16,714	21,223	36,261	27,987	23,553	18,358	14,914	11,673	9,666	6,950	5,336
21-72	Nürnberg	180,951	16,333	12,552	10,916	13,339	16,917	15,333	11,710	8,790	6,854	5,176	4,165	3,251	2,262
19-15	Totals of Group I	2,550,084	274,446	238,637	212,439	232,766	317,240	272,301	232,579	192,463	155,481	124,886	102,455	74,602	52,020
20-72	Aachen	63,899	7,793	6,852	6,388	6,650	6,257	5,157	4,711	4,145	3,602	3,206	2,736	2,302	1,589
18-91	Altona	78,952	9,459	8,713	7,471	6,734	8,122	7,177	6,822	6,013	4,950	4,061	3,041	2,292	1,720
16-22	Barmen	68,227	9,015	7,817	7,175	7,387	6,348	6,403	5,118	4,384	3,515	2,930	2,419	2,008	1,455
18-64	Braunschweig	61,856	7,249	6,786	6,223	6,327	6,394	5,333	4,626	4,202	3,652	2,911	2,412	2,038	1,365
16-62	Bremen	87,9054	10,750	8,566	7,997	9,133	9,595	9,062	7,402	5,745	4,513	4,150	3,438	2,690	1,986
14-56	Cassel	52,188	6,011	4,908	4,592	5,905	8,142	5,136	3,869	3,139	2,645	2,150	1,840	1,415	981
24-26	Charlottenburg	85,840	9,354	8,385	6,684	6,476	11,373	9,176	8,293	7,094	5,601	4,630	3,183	2,403	1,682
17-98	Chemnitz	101,126	12,414	10,485	9,766	10,696	12,023	9,428	7,993	7,209	5,825	4,444	3,656	2,668	2,050
23-57	Crefeld	50,071	5,459	5,025	5,900	5,365	4,242	3,901	3,366	3,296	3,294	2,744	2,208	1,779	1,163
20-52	Danzig	74,754	7,298	6,922	6,203	6,376	11,187	6,634	5,001	4,246	3,545	2,993	2,536	2,062	1,499
19-04	Dortmund	108,594	13,696	11,220	9,392	11,254	13,968	8,986	6,614	4,960	3,730	2,901	2,363	1,568	1,035
17-41	Düsseldorf	75,400	9,722	8,785	8,029	7,686	6,791	11,271	9,304	7,432	6,085	4,565	3,543	2,411	1,749
20-17	Essen	62,472	8,418	7,504	5,383	6,339	7,572	7,912	5,752	4,234	3,000	2,260	1,733	1,301	902
22-21	Halle	76,129	9,316	8,451	8,448	8,272	8,368	6,469	5,688	4,873	4,476	3,492	2,651	1,944	1,497
17-23	Hannover	114,885	12,738	10,931	9,772	11,608	16,261	11,792	9,826	7,725	6,925	5,271	4,114	2,882	2,158
16-55	Kiel	58,859	6,072	5,533	4,338	5,854	11,395	6,394	4,873	3,385	2,719	1,639	1,264	829	549
24-34	Königsberg	87,992	9,197	8,021	8,254	8,635	13,720	8,714	6,334	5,598	4,941	4,254	3,238	2,169	1,749
19-49	Magdeburg	113,924	12,502	11,866	10,967	10,967	14,424	8,981	8,793	8,175	6,743	5,743	4,538	3,426	2,260
19-33	Mannheim	72,768	9,307	7,069	5,568	7,800	9,552	8,891	6,774	5,038	3,817	2,668	2,336	1,601	1,137
23-65	Moson	57,254	6,993	5,790	5,538	5,610	9,743	5,087	3,305	2,877	2,408	1,841	1,640	1,092	752
24-31	Stettin	103,365	11,752	10,200	9,240	9,552	13,350	11,053	8,844	7,299	5,988	4,679	3,614	2,717	1,982
20-64	Strassburg	78,098	6,948	6,025	5,788	7,260	18,306	7,587	5,546	4,556	3,796	2,700	3,071	2,449	1,627
16-96	Stuttgart	84,980	8,057	6,894	6,445	9,830	13,043	9,225	7,008	5,326	4,449	3,805	3,462	2,888	2,011
19-88	Totals of Group II	1,888,177‡	219,895	190,105	172,886	189,804	249,918	188,606	152,765	126,831	104,318	83,902	68,571	52,441	37,029

* From *Statistisches Jahrbuch Deutscher Städte*, Elfter Jahrgang, 1903, pp. 113-115. The numbers in each age-group are those born in the corresponding calendar years, 1896-1900, 1891-95, &c.

† From *Veröffentlichungen des Kaiserlichen Gesundheitsamtes* for November 20, 1907.

‡ Including 8,363 male inhabitants not included in Bremen in December, 1900, but living within the area of the extended Bremen of April 1, 1902.

Population of great towns in Germany, by age-groups.* FEMALE.

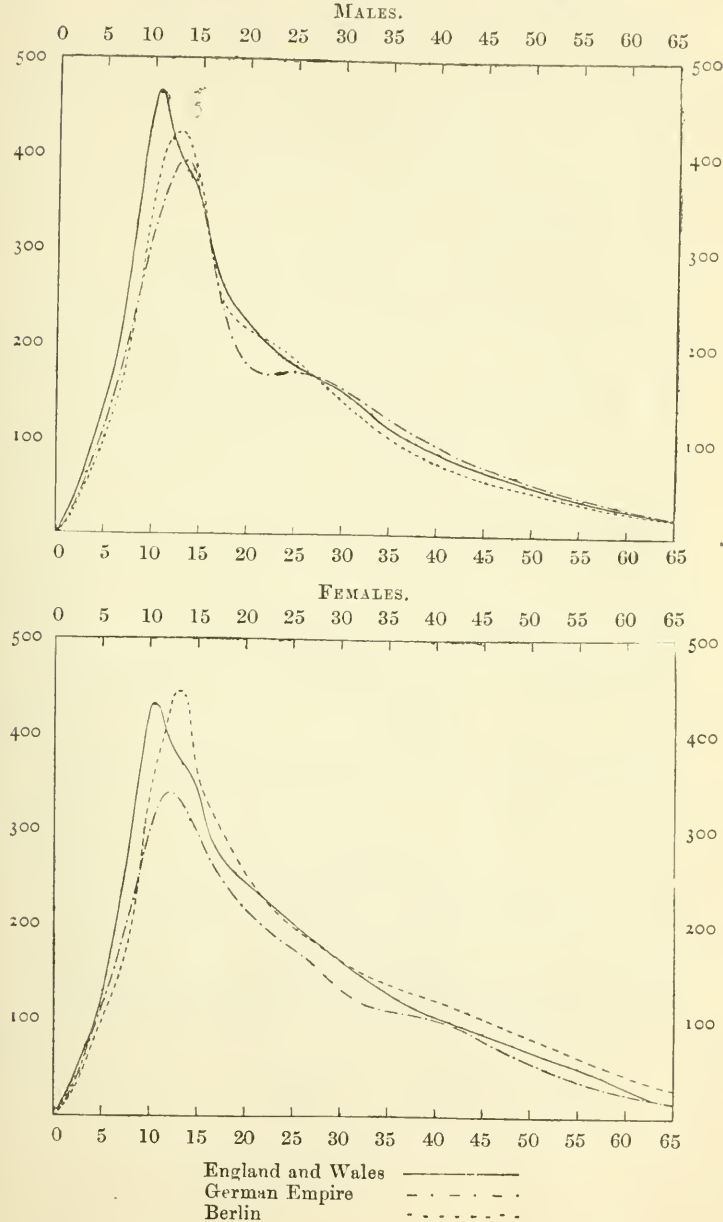
Average for 1895-1904.†		Deaths under 1 year per 1,000 births.	Total female popula- tion in 1900.	TOWNS.										FEMALES.				
Birth-rate (living births).	0-5.	5-10.	10-15.	15-20.	20-25.	25-30.	30-35.	35-40.	40-45.	45-50.	50-55.	55-60.	60-65.					
26-59	87.672	80,163	75,305	90,744	114,277	100,107	88,061	75,932	67,769	54,465	45,456	34,958	27,026					
32-75	23,099	20,173	18,801	22,268	24,469	21,371	18,510	15,361	14,072	11,332	10,888	8,754	6,892					
37-91	22,896	18,937	16,317	18,846	22,152	18,897	15,401	13,033	11,875	8,677	7,581	5,853	4,500					
32-82	20,631	16,599	15,245	21,186	24,943	20,493	17,108	14,345	13,031	10,456	9,272	7,272	5,663					
28-74	14,948	10,403	14,773	21,773	20,420	16,997	13,412	10,341	9,584	7,138	6,249	4,796	3,703					
29-66	40,656	36,958	30,349	32,454	37,194	32,573	30,159	25,260	22,008	18,483	15,701	12,331	9,635					
33-53	25,103	22,695	21,437	24,155	26,916	22,560	19,254	16,110	14,004	11,290	9,165	6,973	5,358					
31-57	24,378	20,636	17,169	23,120	30,468	27,874	24,095	18,412	16,362	12,982	11,715	9,145	7,439					
37-61	16,272	12,372	10,997	12,437	15,602	13,580	11,094	8,458	4,020	5,517	4,539	4,001	3,027					
30-84	274,559	241,022	216,023	259,983	376,381	275,942	237,994	197,452	171,795	140,940	120,866	94,066	73,243					
Totals of Group I...		2,742,012																
Aachen	7,871	7,054	6,538	7,601	7,675	6,029	5,117	4,355	3,986	3,536	3,159	2,578	2,103					
Altona	9,542	8,706	7,579	7,181	7,842	7,565	6,662	5,692	5,030	4,110	3,530	2,901	2,243					
Barmen	8,932	7,800	7,312	7,905	8,392	6,743	5,455	4,388	3,789	3,169	2,781	2,386	1,866					
Braunschweig	7,147	6,614	5,912	6,719	7,025	5,864	5,248	4,523	4,057	3,334	2,868	2,304	1,719					
Bremen	10,540	9,131	7,354	9,352	10,645	8,981	7,125	5,549	5,083	4,608	4,090	3,255	2,558					
Cassel	5,705	4,359	4,402	5,841	6,543	5,169	4,243	3,388	3,012	2,617	2,383	1,797	1,502					
Charlottenburg	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359	4,359					
Chemnitz	9,345	8,213	7,270	10,717	11,020	9,884	8,646	7,363	6,118	4,615	4,140	3,298	2,579					
Crefeld	10,578	10,701	10,177	10,717	10,717	10,717	10,717	10,717	10,717	10,717	10,717	10,717	10,717					
Darmstadt	5,453	5,640	5,931	6,420	6,222	4,613	3,889	3,689	3,643	3,003	2,439	1,939	1,499					
Dortmund	7,340	6,426	6,336	6,740	7,372	6,297	5,363	4,681	4,418	3,573	3,335	2,901	2,393					
Düsseldorf	11,046	9,771	8,654	7,140	7,610	6,521	5,103	4,945	3,307	2,618	2,270	1,714	1,388					
Elberfeld	9,800	8,808	8,148	10,451	12,265	10,204	8,369	6,861	5,702	4,386	3,666	2,925	2,211					
Essen	8,515	6,600	5,148	5,672	6,291	7,318	5,338	4,230	3,277	2,733	2,030	1,821	1,491					
Halle	8,557	8,029	8,550	8,550	8,142	6,006	6,181	5,183	4,776	3,874	3,219	2,623	2,047					
Hannover	12,576	10,953	9,655	12,115	11,712	12,091	9,973	8,319	7,170	5,926	4,823	3,754	3,217					
Kiel	6,008	5,481	4,344	4,509	5,380	4,837	3,928	3,223	2,710	2,183	1,841	1,416	1,136					
Königsberg	9,297	8,075	8,103	9,063	10,428	8,981	7,403	7,281	6,811	5,712	5,281	4,445	3,637					
Mannheim	12,042	11,402	11,507	11,507	11,944	9,820	9,156	8,387	7,234	6,039	4,682	3,737	2,819					
Münster	7,366	5,752	5,326	6,007	6,340	7,456	6,000	1,225	3,410	2,638	2,327	1,866	1,349					
Posen	5,634	5,326	5,326	6,007	6,340	7,456	6,000	1,225	3,410	2,638	2,327	1,866	1,349					
Stettin	10,737	12,052	9,456	9,807	11,338	10,214	8,910	7,397	6,533	5,138	4,373	3,593	2,971					
Strassburg	7,105	6,158	6,032	7,626	8,334	7,371	5,735	4,989	4,276	3,649	3,380	2,741	2,040					
Stuttgart	9,179	8,165	6,853	10,383	12,186	9,860	7,401	6,136	4,463	4,312	4,450	3,712	2,796					
Totals of Group II	220,179	190,963	173,944	196,447	218,414	185,371	154,640	129,580	113,410	92,527	80,885	65,266	51,635					
Totals of Group I	1,957,009																	

* From *Statistisches Jahrbuch Deutscher Städte*, Elfter Jahrgang, 1903, pp. 113-115. The numbers in each age-group are those born in the corresponding calendar years, 1896-1900, 1891-95, &c.† From *Veröffentlichungen des Kaiserlichen Gesundheitsamtes* for November 20th, 1907.

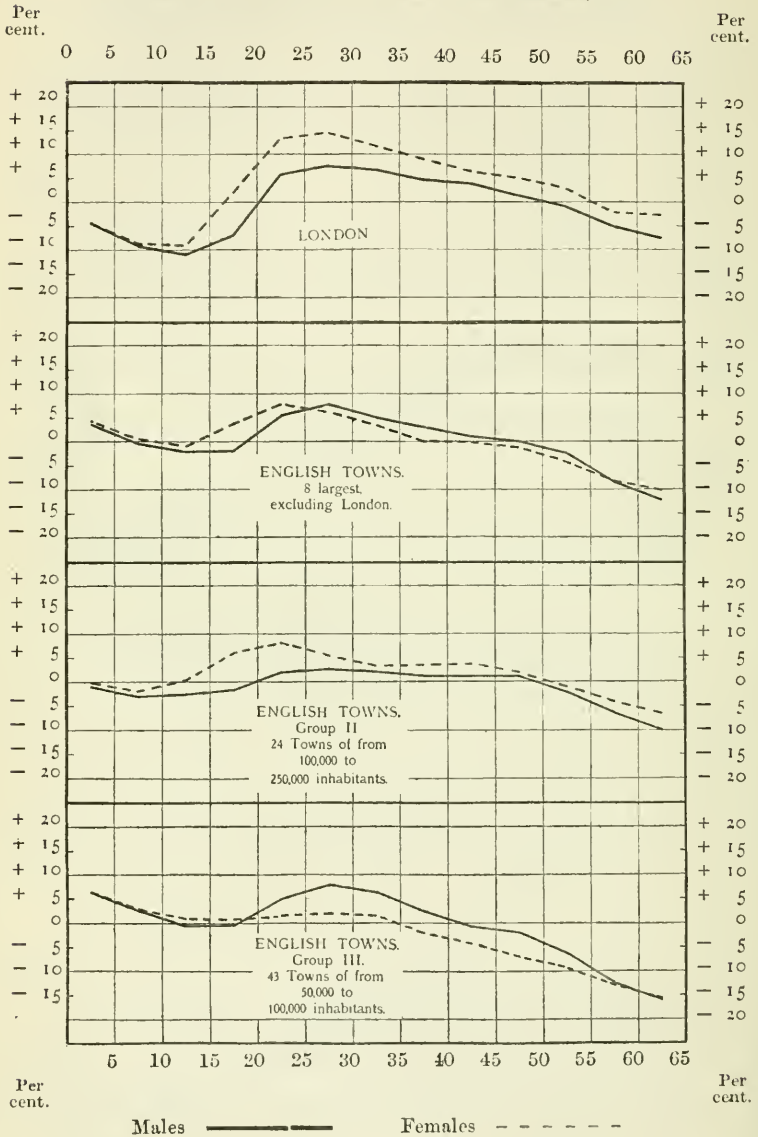
‡ Including 8,639 female inhabitants not included in Bremen in December, 1900, but living within the area of the extended Bremen of April 1, 1902.

Variation of vitality with age, 1891-1900.

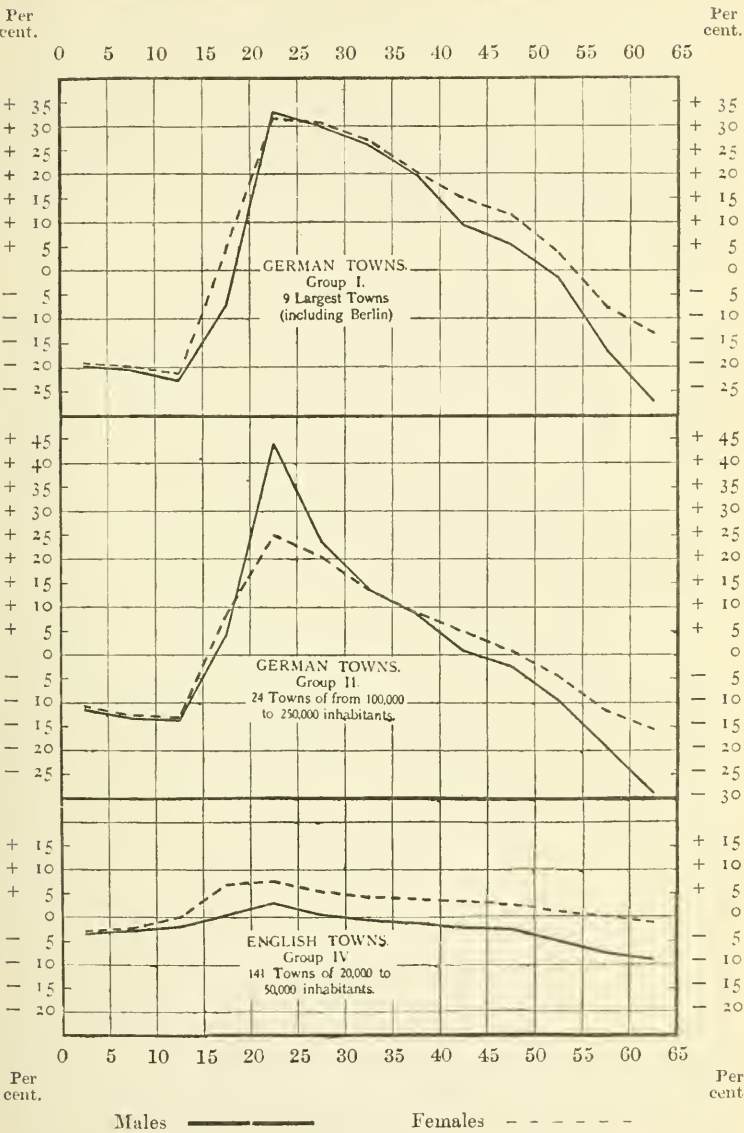
The scale at the side shows the number living to each death annually at the ages shown on the horizontal scale. (*See page 224.*)



Percentage deviations from normal age constitution, 1901.



Percentage deviations from normal age constitution, 1900-01.



DISCUSSION *on* MR. FLUX'S PAPER.

THE PRESIDENT said the Council had decided to adopt, at any rate tentatively, the plan of making the vote of thanks to the reader of the Paper more formal than had been the practice hitherto by nominating two members specially conversant with the subject to move and second it, and thus open the discussion. He would call upon Dr. Dudfield, accordingly, to move the vote of thanks on that occasion.

Dr. DUDFIELD said he had much pleasure in proposing a hearty vote of thanks to Mr. Flux for his most valuable Paper. Although the Paper was full of interesting information and suggestive points, he proposed to put forward some points which were in part more or less independent of the communication and in part amplifications of certain sections. The Paper was naturally divisible into two sections, the first dealing with the increase of towns and the sex-age compositions of their populations, and the second with the results of those factors as shown in the vital statistics. The first question that occurred to him was—what was an “urban” district? The figures given in Mr. Flux’s first table related (at least in 1901) to the 1,122 urban districts scheduled in the Census Report. A reference to that report showed that those districts ranged from small areas such as Childwall (Lancs) with an area of 830 acres and a population of 219 persons, up to the gargantuan district “London” with an area of 75,000 acres and $4\frac{1}{2}$ millions of inhabitants—the City of London and the 28 metropolitan cities and boroughs being counted as one “urban district.” Examining the list more closely it appeared that there were 215 districts with less than 3,000 inhabitants, among the last being 106 with under 2,000. He thought those facts demonstrated a want of that homogeneity which was essential in statistical work. Doubtless the German “urban” districts would be found to have equally dissimilar characteristics. In a study such as that presented by the author they were limited to the use of averages with all their defects, and it was customary to consider density of population as a test of the urban character of a district. Among the districts scheduled by the Registrar-General the density varied from 61 persons per acre (in London) to an average of less than one person per acre in the 215 districts of less than 3,000 inhabitants. No one had attempted to fix a standard of density, but he would tentatively suggest a minimum of 10 persons per acre for an urban district. The evils resulting from town life were the result of complex factors such as insanitary conditions, stress of competition, artificial conditions imposed by society, &c. It was conceivable that an urban population under suitable conditions might present vital statistics differing very little, if at all, from those afforded by rural districts. He thought Mr. Flux did

well in the later parts of his Paper in abandoning "urban districts" in favour of "great towns." The transference of population from the centres to the peripheries of towns was a striking phenomenon of the present day. Numerous examples could be cited in London. One was well known to the speaker. He referred to the colony, both industrial and residential, which had sprung into being within the last fifteen years on the waste lands near Willesden Junction. Dr. Gwynn, the late Medical Officer of Health of Hampstead, drew attention to this emigration to suburbs in 1901, and the latest communication on the subject was the Paper by M. Meuriot, read at the meeting of the Statistical Society of Paris held in July last. The last-named showed that in the case of Berlin the population of the central parts of the city decreased by over 7 per cent. between 1900 and 1905, while that of the outer parts increased by 9 per cent. as compared with an increase of 37 per cent. in the "suburbs" during the same period. Of the vital statistics given by Mr. Flux, those relating to infantile mortality had interested the speaker most. He had had an opportunity of seeing the Paper in manuscript, and had noticed a reference to the high proportion of illegitimate births in South Germany. That part had been altered in the Paper as presented, but the original reference had led him to look into the question. He did not propose to give all the figures on that occasion, but one or two might be mentioned. In the whole of the German Empire the illegitimate births during 1901-05 constituted 8·4 per cent. of all live births, while in England and Wales the proportion was 3·9 per cent. In the constituent States the proportion varied from 7·0 per cent. (Prussia) to 12·72 (Saxony), that in Bavaria (12·59 per cent.) being very nearly as high. In the Empire the infantile mortalities were (1901-05) legitimate 188, illegitimate 320; in Prussia, 179 and 331; and in Saxony, 229 and 321. In the first group of large German towns (*see Mr. Flux's last table*), excluding Hamburg, the illegitimate births constituted 17·6 per cent. of all live births, and the infantile mortalities were legitimate 203, illegitimate 287. In the second group, with 10·7 per cent. of illegitimate births, the mortalities were 187 and 333. A high percentage of illegitimate births did not necessarily (in Germany, at least) lead to a marked difference in the two mortalities. In München, with 26·9 per cent. of illegitimate births, the legitimate mortality was 223 and the illegitimate 235. In Cöln, with 11·1 per cent. illegitimate births, the mortalities were 204 and 302. In the speaker's own district the illegitimate births (1901-05) were 4·4 per cent. of all births, and the infantile mortalities 118 and 275. He thought that the high infantile mortality recorded in Germany was, to a considerable extent, at any rate, independent of the prevalence of illegitimacy, and further, that illegitimacy in Germany had not the same significance in vital statistics that it had in this country. Information as to other factors affecting child-life, such as housing, occupation of mothers, feeding, &c., were necessary to form any conclusions. There were many other points in the Paper which would repay criticism, but he had not had time to take them up. He concluded by formally moving a vote of thanks to Mr. Flux.

Mr. BERNARD MALLET, the Registrar-General, in seconding the vote of thanks, said he had not had much time to give to the study of the Paper, but he thought it was one of the ablest they had heard for a long time, and it would no doubt be widely read and quoted by politicians and others during the next few weeks. The points he wished to touch were mostly technical ones connected with the figures published by his office. On page 209 the author said he had not been able to find English statistics for the population of the added areas. He might mention that the population of the added areas were always given in the census reports, and therefore the increase in population of the large English towns with the extension of areas could be ascertained without much difficulty. He had not done so, partly from want of time and partly because Mr. Flux did not think it very important. Then, on page 229, Mr. Flux stated that he was unable to obtain information for English towns as to the total death-rates in a standard population. That was quite true at present, but it might be of interest to mention that when they were able to carry out the change from registration areas to administrative areas for tabulation, which they wanted to do a year or two hence, that information would be available. The German figures as to nativity in towns, as well as the figures relating to migration, were of the greatest possible interest, and it was to be regretted that similar figures were not available in this country for the past years. The answers to the question on the census schedule would have enabled that information to be obtained, because they knew the birth-rate and knew the place of habitation. But it had never been done. All that had been done was to give the migration from one registration county to another, or to the big towns of over 50,000 inhabitants. Nothing was stated as to whether those emigrants came from rural or urban districts; the information showed only the geographical character of the migration. That was partly due to difficulties arising out of technical reasons, methods of tabulation, and so on. If they could alter the system of tabulation, and get on to the card system and sorting by machine, those and a great many other useful things might be done more easily than at present. There would be much greater flexibility and elasticity in dealing with the figures, but whether that particular point would be worth attacking after the process of migration had been so largely accomplished was a different question. Perhaps the most interesting portion of the Paper was that which treated of infantile mortality. Mr. Flux's figures showed much higher mortality in infancy, together with a rather lower mortality subsequently, in the German towns as compared with the English towns, and that seemed to touch on the controversy whether a high infant mortality had a good effect in weeding out weaklings, or a harmful effect in creating weaklings among the survivors from infantile diseases and bad conditions of life. The figures rather tended to show that the first conclusion might be the true one, and that weeding out was perhaps a good thing; but one could not quite press that conclusion from those figures. There could be no doubt about the great improvement in infantile mortality which was

apparent, not only in England, but all over Europe, since the beginning of this century. Dr. Stevenson had given some interesting passages about that in the Annual Report for the last year, which was published in December, and in which he summed up the figures for the different countries, including Russia and Germany. He might conclude by saying that for England the year 1909 showed the most remarkable progress yet made. For the whole country the mortality in 1907 was 118 per thousand births, which was the lowest on record; in 1908 it was 120, and in 1909 it had gone down to 109. That was 20 per cent. below the average of the preceding ten years, and by far the lowest rate on record. That seemed to show that the efforts which were being made were producing very considerable results.

Sir WILLIAM PLOWDEN said it was especially interesting to him at that time to know, as they did know from the figures just presented, the extraordinary position which Germany was taking up, first of all, in the very large addition which was being made to the German population, and next—and there they had much to congratulate themselves upon—with regard to the condition of things evidenced by the rates of mortality in general, and particularly the infantile mortality-rate. It was quite clear that with the enormous birth-rate in Germany, if there were not a correspondingly enormous death-rate, especially in the infantile years, the population of Germany would be increasing by leaps and bounds. As it was, it was increasing about 1,000,000 per annum; and some complaints had been made on that score by German statesmen. With reference to their own condition in comparison with Germany, it was evident that the study of sanitary improvements and our methods of living had enabled our population to look forward to a longer period of life, and also to a better death-rate, than even Germany, which was progressing in such a rapid manner. He was rather surprised that the author had not drawn attention to what was a most remarkable fact in connection with the infantile mortality, namely, the enormous excess which existed in the rural populations of Germany as compared with the town populations. They did not find that in England, where, as a rule, the infantile mortality was larger in the towns than in the country. But it seemed to be the contrary in Germany; and he would like to know if possible what was the cause. The fact had been commented on very largely by people who had written on the subject of German statistics, and some cause there must be. Another remarkable point was that while the rate of mortality and the birth-rate in the west of Germany had been on a more moderate scale than in the east, it was not brought out in the figures before them. Probably the author did not wish to bring out any distinction between one portion of Germany and another. They were much indebted to him for the able way in which he had treated the figures.

Mr. R. H. HOOKER said that the question of how far suburbs were included in urban districts might have an important effect upon

the birth-rates of the towns compared. As Mr. Dudfield had mentioned, in very big towns the core of the city usually tended to decline in population; round the core there was a ring of stationary population, around this a ring where population was increasing, and further out still a more or less suburban area where population was increasing most rapidly. The birth-rate under conditions like these would vary enormously between the centre of the city, where there would be a very small birth-rate indeed, and the suburban portions where the birth-rate would probably be highest. In the crowded parts of the town the young people who married would go to settle in the suburbs, and the births would all be reckoned there. The question consequently arose whether there was a greater or less tendency in Germany to include suburban areas in the "urban district" than in England. To take an American instance, he had been informed that the limits of the municipality of Chicago were drawn some 20 miles from the centre, and that the town consequently included an enormous rural area. In such cases the birth-rate of the whole "urban" area would be far greater than if the municipality only comprised the crowded centre of an agglomeration of inhabited areas like, *e.g.*, Liverpool. He had noticed that Berlin had a very low birth-rate, and it occurred to him that this might be due to the fact that it was surrounded by suburbs, but the fact that Charlottenburg had an equally low rate negatived this idea. Comparing again the rates in the large towns of the great industrial centre of Germany—Cöln, Barmen, Crefeld, Essen and Dortmund, &c.—it would be found that they differed considerably, varying between $28\frac{3}{4}$ and 44; though the deaths of infants under one year were in many cases practically the same, which seemed to point to the conclusion that the social and other conditions were similar. Such differences in the crude birth-rates could easily be obtained by drawing the municipal net more tightly in one case than in another. Towns in both countries, of course, differed enormously in that respect; but it was most important to have some idea as to whether English or German urban authorities were the more prone to include suburbs. The factor of the suburbs in that connection could, however, be to a great extent eliminated, he thought, in the same way as was done with death-rates, namely, by taking account of the age distribution of the population in the groups of towns. Mr. Flux had calculated the corrected death-rates on a standard population; and it seemed to him that the author might have made a somewhat similar approximate estimate of the corrected birth-rates. On p. 227 the author stated: "We have seen that in Germany the transfer [of persons at reproductive ages] is even greater; and were the true birth-rate maintained even as high in German as in English towns the apparent rate would be higher there than here." That was quite true; but he thought the bare statement did not convey a good idea of how great the difference was. The diagrams indicated that in the first group of the nine largest towns the excess of the females of 20 to 50 years of age was something like 30 per cent.

Did not that mean that the crude birth-rate was some 30 per cent. above that of a "standard" population? It looked to him as if the corrected birth-rate in that group would work out to something like 23 to 24 per 1,000 only, and consequently that the corrected birth-rate in the rural districts would prove to be 35 or 36 per 1,000. In the paper read before the Society three years ago, Dr. Newsholme and Dr. Stephenson made calculations for England and Wales, showing that in urban districts the corrected birth-rate was about 28 per 1,000, and in rural districts 29 per 1,000. The latter had thus a very slightly higher corrected birth-rate in this country; but, if his inferences from the German figures were correct, the rural corrected birth-rate there would be fully 50 per cent. higher. He suggested that if the author calculated approximately, from the data as to ages in the appendix tables, the corrected birth-rates for the groups of towns, the results would bring out very forcibly the enormous difference between rural and urban districts.

Sir SHIRLEY MURPHY said there was one point in the paper to which he would like to refer, namely, the very high rate of infantile mortality in the first year of life. It occurred to him that in order to understand that fact fully one wanted to know how complete was the system of registration of births in Germany as compared with England. He thought the fact that the infantile death-rate of England had not declined until the last few years in response to those measures of amelioration which appeared to have affected the older ages in some degree, might very probably be due to the circumstance that there had been a more complete system of registration of the births of infants who had survived birth by a few hours. Thus, not only the addition of those births to the number of births, but the deaths of those infants would be included. If the German registration of births was more complete in that sense than that of England, it would necessarily affect the figures very much. He would like to know, moreover, whether still-births were registered in Germany. If so he did not suggest that the author had included the still-births among the births of those viable; but it was possible that the fact of registration of still-births might have led to more complete registration of the births of children who live but a few minutes than would occur in a country where still-births were not registered.

Mr. NOEL HUMPHREYS expressed his great appreciation of the value of the Paper, and of the interest attaching to the statistics it contained. Although most of the general conclusions in the Paper were beyond question, it would be well not to lose sight of the difficulty and risk of attempting too elaborate a comparison of international statistics which might be and, he believed, were, both collected and tabulated under widely varying conditions. He thought the author would have increased the value of the Paper very considerably if he could have told them that the census organization and registration system for births and deaths were practically

identical in Germany and in England. Without such an assurance considerable caution was desirable in accepting conclusions based on very detailed comparisons. For instance, they knew that German statisticians had long had the immeasurable advantage of a quinquennial census. In the United Kingdom our Registrars General had not had that advantage. The statistics which they were expected annually to publish were considerably depreciated in value, during the later portion of each 10 years' intercensal period, because our English population has hitherto only been enumerated once in 10 years. It was a fact that between 1891 and 1901 several English towns practically doubled their population; while in a much larger number of towns the population increased more than 50 per cent. Failing a quinquennial census, it had to be assumed that the exceptional rate of increase had been maintained since 1901; but it was obvious that in many cases the continuance of such a rate had not been maintained. The result was naturally to depreciate to a considerable extent the value of the calculated birth and death-rates for such towns, necessarily published from year to year in the Registrar-General's Reports. That Society had used its best endeavours to impress on successive Governments the absolute necessity for a quinquennial census in order to give unquestionable value to the statistics which were prepared and published with so much labour and at so much expense. The Census Committee of the Society had recently brought that matter before the attention of the Government, in the hope that in the new Census Bill, which was being prepared for the next year's census, provision might be made for an intermediate census in 1916; and he hoped that they would now be more fortunate in convincing the Government and Parliament of the essential necessity for a quinquennial census in order to give increased value to all national statistics, of which population was the necessary and natural basis.

Dr. GREENWOOD said that Von Vogl had recently published a monograph¹ on infantile mortality in South Germany, where it was exceedingly high. For example, the mean rate in Bavaria was 285; in Württemberg, 274; and in Baden 222. In that monograph Von Vogl did not give the actual data, but referred to a very extensive map of the Administrative Districts in South Germany, which showed by means of differently coloured areas the distribution of 3 grades of mortality, namely, low, from 100 to 200, moderate, from 200 to 300, and high, from 300 to 400. It struck him that it would be rather interesting to see if there were any relation between the size of the towns in the Administrative Districts and the actual distribution. So far as he could see from an ordinary gazetteer, which was not very accurate, the number of towns in Bavaria with a population of over 20,000 was 18, and with a population of over 10,000, 32. In order, therefore, to see whether it was worth further investigation he made an ordinary four-fold correlation

¹ "Die Sterblichkeit der Säuglinge und die Wehrfähigkeit der Jugend." By Dr. Von Vogl. Munich, 1909 (Lehmann).

table grouping the low and the moderate mortalities together,² while the high made another group; and he worked out the correlation between the size of the towns and the high or the low mortality by an approximate method. It came out $.199 \pm .15$, which was not significant. So far as a rough test like that went there was no definite relation, at any rate in Bavaria, between density of population and infantile mortality. He was rather interested to hear whether it would not be worth while carrying out the test in further detail. One other point was that some capital had been made of the inflection on the mortality curve, especially by German military statisticians. Von Schjerning had recently published a paper³ in which he drew special attention to it, giving also the French figures (males), which contained precisely the same inflection. When they were expressed in deaths per 1,000, the French numbers varied from 7.51 to 7.52 from the age of 21 to 25; for ages 26, 27 and 28, the figures were 7.35, 7.33 and 7.44. Naturally, the inference which it was desired to draw was that compulsory military service actually increased the expectation of life. That was not quite obvious, but it was interesting to see that among the total French males there was the same bend in the diagram as in the German total males.

Mr. T. A. COGHILAN said Mr. Flux had certainly done what he had set out to do, and he was very glad to see that he had left the statistics to speak for themselves, and had not attempted to smooth them over in the way to which they were too much accustomed. Had he done so, they would not have found the inflection in the curve at the age of 25 years; it would have been smoothed right out. After the age of 20 years, the expectation of life in Germany was, as they learned from Mr. Flux's Paper, equal to that in England, but for the lower ages the English expectation largely exceeded that of Germany, in which country the mortality at the very early ages was extremely great. He imagined the explanation was that the

² The actual table is:—

Infantile Mortality.

	High.	Low and Moderate.	Totals.
Administrative Districts containing towns with populations greater than 10,000	17	15	32
Administrative Districts with no towns over 10,000	54	80	134
Totals	71	95	166

The Q_5 approximation was used. As one of the variables is a ratio and the populations of the administrative districts probably vary, some spurious *negative* correlation is introduced. Hence the organic correlation is higher than indicated by the co-efficient. There is, however, no *prima facie* evidence that it is high.

³ *Saintitätsstatistische Betrachtungen über Volk und Heer.* By Otto V. Schjerning. Berlin, 1910 (Hirschwald), pp. 85 *et seq.* Fig. 37 and Table 37.

women were not properly fed, and their children had not during the critical period of their lives sufficient nutritious food. At any rate, anyone who had been to Germany and had seen the laborious work the women performed, how soon after child-birth they had to go to the fields or the factories, and how poor their sustenance was, would easily understand Germany's excessive infantile mortality rate. He believed the real explanation of the large birth-rate in some parts of Germany was to be sought in the religious influence brought to bear upon the parents. A good deal of the urbanization of Germany now going on was due to the fact that there was no emigration from Germany, whereas people went in large numbers from England. Some British Colonies had tried hard to get emigrants from Germany; but the Government was very strict on that point, and no propaganda was permitted.

Mr. YULE said he had read the Paper with great interest, as it had thrown a good deal of light on some problems of German vital statistics in which he was interested, owing to reading a report issued some time ago by the Board of Trade on the condition of the working classes in Germany. In that report there were some data given as to the vital statistics, and some comparison was made with England. The budgets collected by the Board brought out one curious contrast: the average number of children in working class families was distinctly less, to judge by the budgets, in Germany than in this country. Some newspaper criticism made at the time of publication of the report suggested that those budgets must be erroneous owing to the relatively high birth-rate in Germany; but a very slight investigation into the actual census conditions suggested that probably the figures were essentially correct: the birth-rate in fact was not much higher in the large towns of Germany than in the larger towns of this country, and there was a large countervailing infant mortality. Mr. Flux, in his paper, had emphasised that conclusion and had indicated that the average number of children per family was actually less in German than in English towns of corresponding size. The data given at the beginning of the paper with regard to immigration into towns struck him as most interesting; and he thought it would be useful if our census reports could give rather fuller detail as to birth-places somewhat on the general lines of the German reports.

The PRESIDENT said that before formally putting the vote of thanks there were one or two points on which he would like to comment. He feared he could not flatter himself into claiming this paper as one of the *sequelæ* of his inaugural address, as the author seemed to indicate, because he happened to know that Mr. Flux had it in preparation before November. However, they might congratulate themselves on having those interesting figures analysed in a very comprehensive manner, and he was quite sure the vote of thanks would be unanimous. One or two questions of international comparison had been raised which were of great interest to him. For instance, great difficulties arose from the various definitions of urban population, the term being largely conventional. It might be

founded, perhaps rightly, on the relation of population to area, but, as a rule, it was applied more arbitrarily, and often in accordance with tradition, not actual conditions. The only sound comparison, he thought, was between places whose population was large enough to make them undeniably urban. Mr. Flux had done that, as, although in the case of Germany he included aggregates down to 2,000, in examining the statistics in detail, he very properly dwelt mainly upon places with over 100,000 inhabitants, and that, he thought, was the best standard that could be taken in comparing age, sex, and vital or economical conditions with those in rural tracts. Another point in international comparison which gave rise to some trouble was the return of ages. It was all very well to agree to group ages in quinquennial periods or even annual periods; but, as Mr. Flux had pointed out, by asking for the return of the year of birth they lost one-twelfth of a year, a matter of importance in, at all events, the first year of life. With regard to Sir William Plowden's remarks, he did not think any civilised country in the world had shown such remarkable improvement in its life tables of late as Germany, especially in Prussia. The German returns in use before those now quoted gave values so extremely low that he always hesitated to use them in any calculation, because he suspected them of being based upon incomplete or obsolete data. The new tables which Mr. Flux had incorporated gave values far more favourable than the old ones; and in all but the extremes of life, showed an after lifetime better than that of England, in the case of males, though as regards the other sex the difference was slight; and female life, indeed, compared badly in Germany with male. In conclusion, he gave instances from Indian cities to show how delusive might be the conclusions to be drawn from the return of birthplace in estimating the proportion of immigration.

Mr. FLUX, in reply, said that in mentioning the urban districts, he appeared to have introduced into the discussion something like King Charles's head, but he only did it for the purpose of showing that the town populations were growing. Whatever the definition of an urban district might be, the first Table did show that town populations were growing; and it afforded a rough measure of the rate at which they were growing. It had been noted that in all the real comparisons he confined himself strictly to areas which were distinctly urban, and with similar populations in the two countries, so that something like a comparison could be drawn between them. The definition of urban was not the same in the two countries; but, if it were, it would not mean the same where the people were differently distributed, as Dr. Dudfield had reminded them. With regard to illegitimate births in Germany, Dr. Dudfield suggested to him that some reference to the proportion of births that were illegitimate should be inserted, and a sentence in reference to that proportion had been added. He did not go into the matter at greater length, because he did not wish to be drawn aside into a discussion which on the main point was rather irrelevant, though he admitted the great importance

of it. Mr. Bernard Mallet had told them they could deal with the question of the extension of the areas from the census returns; and it was true that one could, on the occasion of each census, find out how much had been gained by certain towns since the last census. But, speaking subject to correction, he did not think it was possible to trace the population of those areas through a series of censuses. One could not distinguish that area from the rest of the town in any subsequent census; it became absorbed, so that one could not bring the figures to compare with those which had been carefully got out for the German towns. The only use he had been able to make of them was to trace the separate entities from 1871 down to date, though perhaps he did not fully recognise what the Registrar-General had placed at their disposal. Sir William Plowden referred to the importance of grouping the results otherwise than by the size of towns; he had not lost sight of that point, and he was tempted to take groups of industrial towns or of towns engaged in similar industries, or separate geographical groups; but that would be to break up the units into small sizes, and very casual causes might have produced very substantial effects. It was only by dealing with those things in the mass that one was able to avoid the risk of assigning to a general cause what was only due to a casual or accidental cause; so that he gave up the plan of that subordinate grouping as practically not feasible for the purpose, though he recognised the difference of conditions in different localities, the different religions, the different areas, and that kind of thing. Mr. Hooker had called attention to the important influence of the suburbs; and one point was at any rate dealt with in the Paper, where a statement was given to show that a population about 50 per cent. of that of the towns was found in the part round them of not more than $6\frac{1}{4}$ miles radius from the centre. On the whole there had been a considerable movement outwards, especially in Berlin. Taking the groups of towns all together they had probably not been influenced to quite the same extent in Germany as in England by that cause, and that might add to rather than detract from the contrast he drew. With regard to the suggestion for a corrected birth rate, he would be glad to see if it were possible to do it within reasonable limits of space and time; but he rather regarded it as a task which might take up a good deal of space in statement as well as a good deal of time in doing, although he recognised its great importance. Sir Shirley Murphy had asked for information with regard to the conditions of registration in Germany. He would not like to say anything very absolute about that; but he had before him a table setting out for each town of above 15,000 inhabitants in Germany the number of still-births, the number of living births and the number of those illegitimate. In looking at those figures, it did not occur to him that there was any suspicion that the still-births were under-stated. In Munich for instance, the proportion of still-births was about $3\frac{1}{2}$ per cent.; and that was so in a considerable number of large towns, and did not seem to be unreasonable. It might be a long way out without his being able to say definitely. Mr. Humphreys referred to the differences in the system of recording, and particularly to the value of the

quinquennial census, with which he thoroughly agreed. He recognised that the absence of a quinquennial census threw a certain doubt on the figures he gave for this country; but it was perhaps worth mentioning that in looking at the figures carried out in the same way for Germany, from 1900 to 1905, when the 1905 census took place a great many of the population estimates had to be written down considerably. How far they could consider that there was less divergence from actual facts in the German case than in our own was doubtful. On the whole, it appeared to him that the probability of error was not very different in the two cases. Of course, if he had been writing two years hence he would have been in a much better position to give precise figures. He did not think he would venture on the question of the suggested correlation between infantile mortality and density of population. Some remarks seemed to indicate that there was no particular relation of that kind in Germany; in fact, so far as the crude figures at a hasty glance suggested, the contrast was not very great between towns and places of sparse population. With regard to the inflection in the German vitality curve for males that Dr. Greenwood called attention to, he might perhaps explain that these diagrams had been given in a little different shape from that in which they were produced in the German Report. There they were done on the basis of the quinquennial average; but that did not wipe out that inflection, which was a subject of comment by the writer of the Report. The substitution of individual year figures for five year averages did make a difference in the peaks, which he considered were worth special study; and therefore he had drawn them from the individual years. As for the cause of the inflection, he had heard other suggestions besides that of military service. It might be asked, if it were due to that, why it was not shown in Berlin as well as in Mecklenburg-Schwerin. Why was it so general in curves for the countries where there was a predominating agricultural population? One writer suggested that it was a question of urban and rural conditions; and it was partly for that reason he thought it worth while to produce the diagram. There was something in the rural districts which differed from the urban even in the countries where it was shown, and it was found in most European countries, but not in Massachusetts nor in England; it was not found in the Berlin curve, nor in that for Hamburg, Bremen, and Lubeck taken together as a group; but it was found in Belgium, though not in marked degree. There the rural explanation seemed to break down. The explanations offered, in fact, did not seem to hold water all the way through. What was the exact cause was, perhaps, a subject for study. He would not venture to express one explanation which suggested itself to his mind, because it was an explanation the validity of which required to be tested by medical knowledge, to which he could not lay claim. He had dealt with the statistics from the point of view of a mathematician only.

The following were elected Fellows of the Society:—

Fabini, Herman Victor.

Johnson, Edward Stewart.

Hart-Synnot R V. O. D.S.O., B.Sc.

Walsh, Robert, F.C.A.

OBITUARY.

Émile Cheysson.

Ce grand homme de science, ce grand homme de bien est mort le 7 février dernier à Leysin (Suisse). Il allait avoir 74 ans, étant né le 18 mai, 1836, à Nîmes. Peu de vies ont été autant que la sienne édifiantes, laborieuses et fécondes.

Il était entré en 1854 à l'École Polytechnique, en 1856 à l'École des Ponts et Chaussées ; et sa carrière d'ingénieur, s'il s'en était contenté, aurait déjà fait de lui un des bon serviteurs de son pays. Mis d'abord en évidence par la construction du chemin de fer de Reims au camp de Chalons et par l'organisation du service des machines à l'Exposition universelle de 1867, il fut, en 1870, pendant le Siègè de Paris, chargé d'organiser, d'improviser la fabrication des farines à l'intérieur de la capitale et fit merveille pour retarder l'heure où la famine rendrait la capitulation inévitable.

Après, comme avant la guerre, son rôle administratif fut brillant, quoique un peu accidenté ; en dernier lieu, il était Inspecteur-général des Ponts et Chaussées, en retraite, et Commandeur de la Légion d'honneur.

Mais, ici, le fonctionnaire est moins à considérer que le Statisticien, ce mot d'ailleurs devant être pris dans son acception la plus large.

Quoique le grand Traité de Statistique qu'il nous avait promis n'ait pas vu le jour, cette science, qui est aussi un art, a de grandes obligations à Émile Cheysson. Il y était prédestiné par sa forte éducation mathématique, par son goût inné pour l'observation, l'enregistrement et la classification des faits, par la tournure précise et méthodique de son esprit. Lorsque, en 1877, il fut nommé Directeur du service des cartes et plans au Ministère des Travaux publics, il en fit surtout un grand bureau de statistique et mit en train, presque simultanément, deux publications importantes : un *Bulletin de Statistique et Législation comparée*, analogue à celui du Ministère des finances, et un *Album de statistique graphique* qui devait être réédité annuellement. Depuis, l'Administration a cru devoir faire l'économie de ces deux recueils ; et on ne peut que le regretter. Le second constituait un document unique en son genre. Qui ne se rappelle ces belles cartes de France où des rubans colorés de largeurs inégales donnaient, à première vue, la mesure du trafic respectif tonnages et recettes, de nos voies ferrées et de nos voies navigables ? Plus suggestifs encore étaient ces tracés concentriques qui, dans

l'Album de 1888, montraient la France se réduisant peu à peu, comme étendue, par l'accélération graduelle des moyens de transport depuis deux cents ans.

Les multiples études de Cheysson sur la statistique géométrique lui font aussi grand honneur.

Mais à la statistique proprement dite, il préférerait peut-être les applications de la méthode monographique, telle que l'avait inaugurée et codifiée Frédéric Le Play. Collaborateur de Le Play à l'Exposition de 1867, Cheysson était devenu son élève, son disciple, son ami, et n'a pas peu contribué à faire vivre et prospérer la pensée du maître. On connaît la double collection de monographies et budgets de familles intitulée "Ouvriers européens et Ouvriers des deux mondes." La vie du prolétaire, dans les diverses professions et dans les divers pays, est analysée là d'une manière si homogène qu'on pouvait être tenté de superposer numériquement tous ces petits budgets. C'est ce que Cheysson a fait pour cent des ménages qui figurent dans la collection. Ce grand travail synoptique met tout à la fois en lumière les avantages et les côtés faibles de la méthode monographique.

Il existe un lien étroit entre les recherches du statisticien et celles de l'actuaire. Toujours aussi attentif à la pratique qu'à la théorie, Cheysson se fit comme l'éducateur des œuvres sociales françaises, assurances, sociétés coopératives, sociétés de secours mutuels, etc. Pour que de telles entreprises puissent compter sur l'avenir, il importe qu'elles mettent leurs opérations, leurs engagements surtout en parfait accord avec les lois du calcul des probabilités : or, il arrivait trop souvent qu'elles n'en tenaient pas compte et c'est ce que Cheysson a utilement démontré dans une brochure dont le titre est bien significatif : "L'imprévoyance dans les Institutions de prévoyance." La philanthropie, de Cheysson fut toujours aussi scientifique que généreuse : toute fondation nouvelle destinée à améliorer le sort des déshérités de ce monde était sûre d'obtenir son concours et de s'en trouver bien. Il était membre de plus de cent associations scientifiques ou humanitaires et apportait à chacune un concours des plus réels, voire même des plus prépondérants. Il en dirigea et en présida beaucoup : le Musée Social, la Société d'Économie Sociale, la Société de Statistique de Paris, la Ligue Nationale de la Mutualité, la Société française des habitations à bon marché, la Ligue Antialcoolique, la Société d'hygiène et de médecine publique, l'Alliance d'hygiène sociale, la Société générale des prisons, la Ligue populaire pour le repos du dimanche, le Comité central des œuvres d'assistance par le travail, etc., etc. Tel était son zèle pour le bien qu'il trouvait moyen d'être sur la brèche partout à la fois.

Il se dépensait ainsi sans compter. Les amis ont parfois regretté qu'il n'ait pas été plus économe de ses forces et de ses talents. Son œuvre écrite se trouve dispersée en une multitude de brochures, rapports, discours, etc. Et, toujours surmené, il n'est pas arrivé à mettre au point les deux ou trois beaux livres qu'on attendait de lui.

Il a pu, du moins, exercer comme professeur une influence considérable sur la jeunesse française. Il a été pendant de longues années professeur d'économie industrielle à l'École nationale des mines, professeur d'économie politique ou d'économie sociale à l'École libre des sciences politiques. Il trouvait là des auditoires d'élite et s'en montrait digne. Sa culture littéraire était à la hauteur de sa culture scientifique. Il avait en 1901 remplacé Maurice Block à l'Académie des Sciences morales et politiques (section d'économie politique, statistique et finances) et sa mort imprévue a été un grand deuil pour cette compagnie, comme pour tous les groupes, de natures si diverses, dont il faisait partie. Elle laisse inconsolables les vieux amis qui, mieux encore que les autres, connaissaient la sûreté de ses sentiments, l'agrément de son intimité, la puissance de son intelligence, la bonté de son cœur et l'élévation de son âme.

A. DE FOVILLE.

MISCELLANEA.

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- I.—*Methods of Crop Reporting in Different Countries.*¹ By ERNEST H. GODFREY, *Census and Statistics Office, Department of Agriculture, Ottawa, Canada.*

IN these days of rapid communication and transport it is of primary importance that statistics relating to supplies of human food should be as trustworthy as practical experience and the best scientific methods can make them. The economic conditions governing supply and demand throughout the world have changed fundamentally during the last part of the nineteenth century, and even now this economic revolution is still in progress. Producers, consumers, merchants, bankers, economists and statisticians are all interested in the issue by competent and impartial authority of accurate crop reports, and the universal need of such reports has lately found expression by the establishment in Rome of an international agricultural institute representing forty-eight countries, one of the chief functions of which will be the collection and distribution of accurate information with regard to the harvests of the world.

The subject divides itself naturally into two branches concerned respectively with (1) definite records of areas and yields of the principal crops compiled in a scientific and systematic manner, and (2) statements of the condition of the principal crops during growth with careful estimates of areas and forecasts of yields made either before, during or after harvest. Under the first of these branches the statistics collected may for convenience be called absolute, representing as they do the finally revised verdict of the officials responsible for them, whilst those under the second, though prepared by the same officers and possibly by the same machinery, may be called approximate. The latter indeed scarcely come within a strict definition of the term "statistics." Although serving a useful immediate purpose as approximate indications, they are necessarily tentative and temporary, and are ultimately replaced by permanent records obtained by statistical methods of greater accuracy.

¹ A paper presented in the Agricultural Sub-section of the Winnipeg Meeting of the British Association, August 25 to September 1, 1909.

Agricultural statistics, properly so called, have for many years been regarded in most civilised States as a natural part of the functions of administrative government, and the work is generally undertaken by an agricultural ministry or department. On the other hand, statements of the progress of crops during growth and pre-harvest estimates of yield have too often been left to non-official investigation. Though probably in most cases these estimates are based upon conscientious inquiries by skilled experts, they are not always accessible to agricultural producers, who therefore are placed at a disadvantage, whilst in any case they necessarily fail to inspire the confidence which independent estimates put forth on government authority alone can give. Further, the absence of government reports leaves the door open to misleading statements on the part of the unscrupulous, especially with regard to crops such as cotton and wheat, that are the subject of commercial speculation. During the last ten years, however, increasing attention has been given to this side of the question, with the result that every wheat-growing country of importance now publishes in respect of the principal agricultural crops estimates of areas and yields and statements of the condition of crops at different periods of the season of growth. These are based upon more or less elaborate inquiries, and the condition of growing crops is in certain cases expressed by numbers.

The following is an attempt to indicate briefly the systems adopted by the principal wheat-using countries of the world, for reporting on the progress of the principal agricultural crops during growth and for making trustworthy estimates of areas and forecasts of yields, with some reference to the statistical methods adopted in respect of agriculture generally.

United Kingdom.

In Great Britain the earliest record of land statistics is the Domesday Book, which is said to be also the earliest record of its kind in Europe; but probably the first attempt to chronicle the agricultural resources of the kingdom was the inquiry undertaken towards the close of the eighteenth century by the old Board of Agriculture (1793-1822), under the presidency of Sinclair and the secretaryship of Arthur Young.

The present system for the collection by government authority of annual statistics as to the acreage of agricultural crops and the numbers of farm live stock originated in 1866, the data being obtained upon schedules issued to occupiers through the officers of Inland Revenue. From 1866 these statistics were collected and published by the Board of Trade, from 1883 to 1889 by the Agricultural Department of the Privy Council, and from 1889 onwards by the present Board of Agriculture. For the first eighteen years the statistics collected related solely to the acreage of crops and the numbers of live stock, but in 1884 the Agricultural Department of the Privy Council commenced, and in 1889 the Board of Agriculture continued the collection and issue of annual statistics as to

the yield of the principal crops, the information being obtained by specially appointed local estimators. These estimators were at first chosen by the Inland Revenue, but since 1904 the Board of Agriculture has exercised the sole control over their selection and appointment.

The system adopted in Great Britain is well known to British statisticians, and need not, therefore, be explained in any detail. It will suffice to state that the required information is collected by means of schedules issued to over 500,000 occupiers, and that as a rule all but about $2\frac{1}{2}$ per cent. of this number duly fill up and return the forms. The ancient spirit of suspicion that the collection of agricultural statistics was in some way connected with taxation has given way to one of general confidence in the accuracy and value of the official agricultural statistics of Great Britain.

In 1905 the Board of Agriculture commenced the annual issue in July, August and September of reports on crop prospects during growth, these being based upon returns from the Board's staff of crop estimators. The returns are reduced to numerical estimates of total yield, expressed as the percentage of an average crop represented by 100, the average being that of the actual annual yields for the preceding ten years. The estimators are instructed to make reports from their own observation, supplemented by the best information they can obtain, on the 15th of each month. Each estimator fills in a blank schedule in respect of wheat, barley, oats, potatoes, roots and grass, including hay, his answers to questions asking—(1) whether the area planted of each crop is greater or less than the previous year, and to what extent (July only); (2) the present condition of the crop as regards plant, vigour and healthiness; (3) the nature of insect pests or disease (if any) and the extent to which crops are affected; (4) the probable yield of the crops as compared with the previous ten-year average. A report as to the present prospects of special crops, such as hops, fruit, &c., where grown in an estimator's district, is also asked for, including particulars of any noteworthy damage by insect pests or disease. They are required to express their estimates of the probable yield per acre, as compared with the average, as definitely as possible, and to use the following terms or the numerical equivalents. Thus, "fairly good" = about 5, "good" = 10, "very good" = 15, "extremely good" = 20 per cent. or more above the average. Similarly, "poor" = about 5, "bad" = 10, "very bad" = 15, "extremely bad" = 20 per cent. or more below the average. The average is defined as a crop that is about equal to the average yield per acre of the last ten years, this average being well known to the estimator. Each report as finally issued by the Board gives in summary form general remarks relating to the crops for the whole country, and also, in respect of each crop reported on, remarks applicable to each of the districts into which for statistical purposes Great Britain is divided. From the numerical estimates submitted by each correspondent are calculated the percentages for the whole country.

The Irish agricultural statistics are now collected and published

by the Department of Agriculture and Technical Instruction for Ireland through the Royal Irish Constabulary, whose officers act as superintendents and enumerators for the collection of the statistics. The collection of agricultural statistics in Ireland is a complicated business, and in addition to the general instructions no less than 33 forms and schedules of all shapes and sizes and of different colours for the sake of distinction are issued from headquarters. The fact also that there are three different land measures in use—viz., the Irish, the Cunningham, and the statute acre—introduces a further element of difficulty, and the Irish or the Cunningham measure, in which the areas may be returned by farmers, has to be converted into statute acres before the returns are made to the Department. The statistics are, moreover, collected with great particularity, and include detailed information as to the size and nature of the tenancy of holdings, the areas under grain crops, hay, pasture, fallow, mountain land, woods, turf, bog, marsh, water, roads, fences, potatoes, including varieties, fruits, flax, agricultural implements, live stock, including breeds and returns of mortality, produce of crops, corn and scutching mills, malt houses, bee-keeping, dairying, poultry, forestry, &c.

Reports based on information collected by the constabulary are issued June 1, July 1, mid-July and end of July on the condition and appearance of the crops during growth. No method of numerical expression is attempted, the reports received being summarised by counties in the form of general remarks, quality being indicated by the terms "average," "fair," "very fair," "good," "very good," but without reference to any particular standard beyond the usual signification of these terms.

France.

In France the homogeneity of the system of local government lends itself to a comprehensive and rational scheme of statistical organisation, and such a scheme has, in fact, been gradually evolved and perfected, each of the local authorities from the commune to the department now taking their share in the preparation of statistical tables.

Properly to understand the present French system of agricultural statistics, a knowledge is desirable of its historical evolution, and this may be obtained by perusal of an admirable sketch in the *Bulletin Mensuel* for May, 1909, of the French Ministry of Agriculture.² The following historical events having reference to agricultural statistical inquiries may be briefly mentioned.

The first inquiries in France of an economic and statistical character were ordered by Charlemagne, who instructed the Missi Dominici to go into all the provinces and obtain detailed information as to population, the nature of the soil, agricultural products and the revenues of the land owners. Records of grain

² *Organisation du Service de la Statistique Agricole en France. Bulletin Mensuel de l'Office de Renseignements Agricoles.* Paris, May, 1909, pp. 630 - 658.

prices date from 1559, when Francis I by the Edict of Villers-Cotterets imposed on municipalities the obligation of publishing weekly statements of food commodities with prices. In 1572 Charles IX prescribed the preparation by provincial governors of half-yearly statements on the condition of agricultural crops. In 1700 Colbert ordered a general statistical inquiry which embraced agriculture. In 1789 Necker constituted a special administration to receive information upon agricultural production. This, known as the "Balance du Commerce," was the first attempt at an official statistical service. During the revolutionary period the communal councils were instructed to nominate honest and intelligent commissioners skilled in agriculture to prepare a general statement of all the lands bearing any product whatsoever. In 1840 was conducted the first general statistical inquiry on the principle that now obtains, viz., the collection on the spot in the smallest areas of data serving as the basis for a general work, the communal figures being collected to obtain those of the cantons, arrondissements, departments, regions, and finally of the whole of France. In 1852, on the occasion of a new general inquiry, cantonal commissions were instituted, the members being nominated by the prefects of the departments. These commissioners were entrusted with two kinds of inquiries: (1) annual inquiries limited to an indication of the principal crop areas and yields; (2) decennial inquiries into the total of agricultural production and the most important facts of rural economy. These cantonal commissions divided themselves into sub-commissions according to the number of communes in the canton. Similar decennial inquiries were made in 1862, 1882 and 1892. In 1899 the Minister of Agriculture re-established the cantonal statistical commissions constituted in 1852, but which had almost everywhere ceased operation. The statistics of 1900 and 1901 were conducted by the aid of these commissions, but the general results were reported as being far from satisfactory. By decree of April 25, 1901, the present Office de Renseignements Agricoles was formed as a branch of the Ministry of Agriculture, and the agricultural statistics of France are now collected and published under the system then adopted. By decree of August 27, 1902, the agricultural inquiries undertaken by this Office were settled as follows: (1) annual agricultural statistics; (2) periodical or non-periodical special agricultural statistics; (3) agricultural economic inquiries. It is with the first two of these that we are now more immediately concerned. The decree just quoted set up a local commission with the special duty of keeping a register of the crops within its jurisdiction. The register records the total agricultural area of the commune, the area of the different crops and their average yields. By means of the register which is constantly corrected and kept up to date the information required for the purposes of the annual agricultural statistics can be supplied with far greater ease and accuracy than by estimates made quickly at the moment when the schedules have to be filled up.

The rôle filled by the officers who are known as departmental and special professors of agriculture, in connection with the

collection of agricultural statistics, is an important one.³ In every department is a professor of agriculture, who works under the prefect, and is subject also to the Minister of Agriculture. He lectures on agricultural subjects in schools and colleges and to farmers, and is generally responsible for agricultural organisation throughout the department. His work is supervised by inspectors of the Ministry of Agriculture in Paris, and he controls the work of the special professors of agriculture, of whom as a rule there is one for each *arrondissement*. The departmental professor advises the prefect and the central administration on all matters connected with agricultural statistics, including the preparation of the necessary schedules, instructions, &c., and he prepares from the figures of the *arrondissements*, with the aid of the staff at the prefecture, the agricultural statistical tables for the whole of the department for transmission to the Ministry of Agriculture. The special professor organises agricultural instruction and lectures within his *arrondissement*, and he is paid partly by the town in which he lives and partly by the prefect of the department. Under the departmental professor he has similar duties with regard to the agricultural statistics of his *arrondissement* to those performed by the professor for the department. The communal commission is composed of a small number of members, including necessarily practical agriculturists. The information it collects, being of an individual and therefore confidential character, is kept at the office of the mayor, and the secretary of the commission is usually also the mayor's secretary, the office being often filled by the local schoolmaster. The commission prepares a list of all the occupiers in the commune, with particulars as to areas and crops, and for this purpose has access to the communal taxation registers. In many cases the information as to crop areas is obtained by forms, which are filled up either by the cultivators themselves, by the *garde champêtre*, or by the commission's secretary, from information which the cultivators supply. The communal commission serves as the statistical unit. It collects the initial information upon which subsequent inquiries are based, and is especially concerned with the area under each crop. When filled up the communal schedules are transmitted to the cantonal commission, which prepares therefrom abstracts containing the results of all the communes in the canton. These are then sent to the special professor for the *arrondissement*, who prepares a table including the figures from all the cantons for transmission to the departmental professor, who in his turn includes the results of all the *arrondissements* in a table for the department. The professor completes this table by adding to the areas the average yield per hectare and the average prices, and the table when thus completed is sent to the *Office de Renseignements Agricoles*, where the results from all the departments are tabulated and published.

There has also been organised a corps of voluntary agricultural correspondents of the *Office de Renseignements Agricoles*. Their duties consist in the furnishing of information to the special professors of agriculture in *arrondissements* and to the departmental

³ The professors of agriculture usually graduate as *ingénieurs agronomes* at the *Institut National Agronomique*.

professors of agriculture. They also correspond directly with the Office de Renseignements Agricoles, either by postcard, letter or telegram, with a view to furnish information of immediate interest.

The special periodical or non-periodical agricultural statistics partake of the nature both of statistics and inquiry. Their special object is to furnish exact and frequent information as to areas under different crops, their condition and appearance at different periods of the growing season, and their approximate yields. The duty of making these reports devolves mainly upon the special and departmental professors. The information is collected by means of seven different schedules, which are filled up by the special professors for the arrondissements, who then transmit them to the departmental professors. The latter fill up similar schedules for the department, and send them for final compilation for the whole of France to the Office de Renseignements Agricoles. The following indicates briefly the nature of the information collected by the seven schedules.

Schedule I gives the area under autumn sown cereals and the condition of the crops on January 1; Schedule II the areas under autumn and spring sown crops and the condition on May 1; Schedule II (a) the areas and condition on June 1 of crops other than cereals; Schedule III relates to the condition and yield of all crops. It is issued on the first of every month except January. It is intended that the yields shall be indicated on this schedule as and when the harvests take place of the various crops in the different parts of France. Schedules IV and V are designed to record the approximate yields of the principal cereals. They are prepared immediately after harvest. Schedule IV records the yields of wheat, maslin and rye; Schedule V those of barley, oats and maize. Each of these schedules contains columns for recording the acreage (which checks or verifies the acreage as previously recorded), the total production in hectolitres and in quintals, with a column also for the mean weight of the grain per hectolitre, and three columns for the average production per hectare of the grains in hectolitres and quintals, and of straw in quintals. These schedules are required to be filled up immediately after the harvest by the special professors of agriculture in respect of arrondissements. They are then despatched to the departmental professors, who fill up exactly similar forms for the department. The departmental tables are required to be sent to the central office by August 1 for departments south of the Loire, and by August 15 for departments north of the Loire. Schedule VI records the area and yield of root crops, and the same procedure is followed, except that the schedules are completed during October by arrondissements and are despatched to the central office from the departments before November 1. Schedule VII relates to the wine and cider crops, and the results are returnable at the same times as those of the root crops.

The condition or appearance of the crops to which reference has been made as the subject of record on the first of each month is indicated numerically by a scale of points, of which 100, signifying "very good," is the maximum. The complete scale is as follows:—

100 = very good	60 = fairly good	30 = poor
80 = good	50 = fair	20 = bad

No attempt is made to assign a number representing condition for any crop in respect of the whole country, but it is usual to indicate the number of departments in each category, and this gives some indication of the general state of agriculture at given dates throughout France. By weighting, however, the departmental averages according to acreage it is possible to obtain from the data given numerical points applicable to the whole of France; and this plan is actually followed by more than one foreign agricultural department, with the object of obtaining comparative agricultural results for different countries.

Thus the great principle in the case of the French agricultural statistics is decentralisation. The central office in Paris is concerned mainly with results by departments. Probably the more centralised systems pursued in England and in some other countries would be unworkable in a country like France with its intensive system of "petite culture" and the large multiplication of its proprietors, *métayers* and cultivators. The whole system is elaborate, and is probably at the present time as trustworthy as any in Europe. Whilst a great deal of the work of collection and compilation falls upon the paid servants of the State, as in the case of the central office, the prefects and their staffs, the agricultural professors and the communal officials, yet a vast amount of the work is of an unpaid or voluntary character. No funds are at the disposal of the Minister of Agriculture for the remuneration of non-official persons who render assistance, but diplomas and medals are granted on the recommendation of the prefects and departmental professors to the members and secretaries of communal and cantonal commissions, to the correspondents of the Office de Renseignements Agricoles, and to other helpers whose services are specially indicated.

Germany.

In Germany, government official statistical information of all kinds is issued by a special department, known as the Imperial Statistical Office (*Kaiserlich Statistisches Amt*), and the issue of reports on the condition of growing crops and on their acreage and yield is part of the work of the Office. The regulations now governing the collection of these statistics were promulgated by decree of the Federal Council, dated January 19, 1899, but these regulations replaced those under which the system was originated in 1893 by a decree of July 7, 1892. Information as to the condition and yield of crops is collected from expert correspondents, selected by the governments of the various States. Under the original scheme there were throughout Germany 3,868 correspondents, and on the average each correspondent was responsible for an agricultural area equal to 91 quadratkilometers, or 22,487 acres. By the decree of 1899 the number of correspondents was almost doubled, being increased to 6,474, and the average area reported upon by each was accordingly reduced to 54 quadratkilometers, or 13,344 acres. Of the correspondents appointed in 1899, 4,570, or over 73 per cent., are for Prussia alone, the average area covered by each Prussian correspondent being 12,600 acres. The next largest number

is in Bavaria, where 294 correspondents have each on the average a district to report upon of 39,000 acres. Of the twenty-six German Federal States the correspondents in eleven, numbering 557, report direct to the Imperial Statistical Office; the others, numbering 5,917 in fifteen States, including Prussia and other large countries, do not report direct to the Office, but to a Central Land Station in Berlin. In these fifteen States also the reports are prepared for their respective districts by local Chambers of Agriculture (*Landwirtschaftliche Kammern*), which are partly supported by government assistance. The Central Land Station compiles abstracts from the reports of the correspondents and sends them to the Imperial Office, where from these abstracts and from the reports received direct from the individual correspondents in the other eleven States the statistics for the whole of the German Empire are compiled.

The correspondents make their reports on schedules printed on reply postcards, issued monthly from April to November by the Imperial Statistical Office. The April postcard is issued in March, with printed instructions explaining the nature of the reports required during the season. Similar postcards are sent from May to September to reach the correspondent by the 12th of each month. He is also furnished with printed reminder postcards, which he posts to the Office in case the usual postcard fails to arrive. The reply postcard expressing the condition of the crops on the 14th of the month has to be posted between the 14th and the 16th of the month.

The following crops are thus reported on: April-August: winter wheat of current year; October-November: winter wheat of next year; May-August: spring wheat; April-August: winter spelt and rye of current year; October-November: winter spelt and rye of next year; May-August: spring rye, barley and oats; May-September: potatoes; April-September, clover and grasses, lucerne, water and other meadows.

With the letter of instructions is sent to each correspondent a blank schedule for the entry of duplicate particulars of his reports on the condition and yield of crops. This schedule he retains for reference and comparison, and it enables him to maintain an even standard when representing the condition of crops by numbers as subsequently explained. On the May postcard the correspondent is also required to estimate the percentage of each area under winter wheat, spelt, rye, clover and grasses which it has been necessary to plough up owing to these crops having been winter-killed.

Finally, in November, estimates are required as to the yield per hectare in double zentners (100 kilogrammes) of winter wheat, winter spelt, winter rye, spring rye, barley, oats, potatoes, clover and grasses, lucerne, water meadows. In giving the yield of potatoes an estimate of the percentage of diseased tubers is also required. The yield of clover, lucerne, meadows, &c., is expressed in double zentners of the weight per hectare as hay. Where the grass or clover is used green the hay weight is obtained by dividing the weight of the green fodder by 4.

The numerical method by which the condition of growing crops is measured in Germany is simple in result, but somewhat complex

in operation. In the scale adopted 1 represents very good, 2 good, 3 medium or average, 4 poor, 5 very poor. Each correspondent attaches one or other of these figures to each of the crops reported on, and the averages are worked out in the central office for the whole of Germany. Correspondents are instructed to avoid giving any range as would be implied, for instance, by the use of numbers 1-4, 2-4, 3-5, &c.; where closer estimates are desirable and possible they are permitted to use a decimal point. Thus, if the condition of a crop is considered to be midway between 2 and 3, it may be registered as 2.5, and so on for other gradations.

Where there are disturbing factors which prevent the application of a single figure to the whole crop of a district, as, for instance, where a wheat crop on a large area of clay soil may be excellent while that on another area of sandy soil may be the reverse, or where crops differ owing to their cultivation on marshlands, uplands, &c., the correspondent is instructed as to the method he should adopt in order to arrive at a number which fairly expresses the condition of the crop for the whole of his district. He first estimates approximately the area of the crop under each different category, assigns to each the number which properly expresses its condition, and then works out an average figure for the crop in the whole district. The following is a concrete example of the method recommended. Assume that the figure 2 representing "good" expresses the condition of winter rye on marshlands occupying seven-tenths of the whole area of the crop in the district; that 3 or "medium" is the condition of two-tenths of the crop on clay, and that 5 or "very poor" is applied to the remaining tenth on sandy soil, the average condition of winter rye for the whole district will be reckoned as follows:—

$$\frac{7}{10} \times 2 + \frac{2}{10} \times 3 + \frac{1}{10} \times 5 = \frac{14 + 6 + 5}{10} = \frac{25}{10} \text{ or } 2.5.$$

The yield of a crop in a district of unequal conditions is estimated on the same principle. Thus, assume that the oat crop of a district is divided into seven-tenths on marshlands and three-tenths on sand, that the former proportion yields at the rate of 20 double zentners, and the latter at 10 double zentners per hectare, the average yield of the oat crop for the whole district will be computed as follows:—

$$\begin{aligned} \frac{7}{10} \times 20 + \frac{3}{10} \times 10 &= \frac{140 + 30}{10} = \frac{170}{10} \\ &= 17 \text{ double zentners per hectare.} \end{aligned}$$

The same principle of computation is expected to be applied by the correspondent in cases where the crops have been partly injured by drought, wet, frost, hail, storms, cloudburst, flood, animal and plant pests, &c., the result being in all cases reported to the Office as the average yield for the cultivated area in the district.

On the postcards space is left blank for "remarks," and each correspondent is requested to give brief information as to the influence of the weather, the progress of tillage operations and of

plant growth, especially at the beginning and close of the blossoming period, damage to plants, &c.

The results posted monthly to the Imperial Statistical Office on the postcards by individual correspondents and those received in the form of abstract from the Central Land Station are tabulated and published about the 24th of each month in the *Reichsanzeiger*, separate copies being forwarded to correspondents and others interested. The statement gives the condition by number extended to one decimal by federal States and government districts as well as the average for the whole empire for each crop, with, so far as the whole empire is concerned, the comparative figures for the previous month and for the corresponding month in each of the previous ten years, and the average of the previous ten years. General remarks relating to the influence of the weather and other circumstances affecting the crops are also given. Accompanying these particulars are charts, which by means of different hatchings corresponding with the numbers express graphically for each cereal in the different provinces and government districts the condition of each of the principal cereals.

The whole system, and especially that part of it which requires weighted averages to be worked out for local districts, presupposes that the correspondents employed are practical farming experts of superior intelligence and education.

Austria.

Agricultural statistics in Austria are collected and issued by a Central Statistical Commission, formed in connection with the Department of Agriculture. An official survey, giving by communes the areas of the various descriptions of cultivated and uncultivated lands throughout the kingdom, is revised from time to time, and the local surveyors notify annually the changes made by landowners. The survey takes, however, no account of the different agricultural crops annually grown, and the collection of statistics of the areas and yields of these is undertaken by the Central Commission. The work is performed largely by the aid of agricultural societies, clubs, committees, and, where they exist, of agricultural statistical offices, which receive State subventions corresponding to the size of the districts they respectively represent. In spring, changes of cultivation are noted by comparison with the previous year's acreage, the information being obtained partly by the issue of schedules of questions and partly by direct inquiries. In some parts of the country the proportion which the areas under particular crops bear to the total area is for large districts estimated by determinations of areas under cultivation in single, carefully selected typical districts. The practice in making these computations is to send skilled experts, who select the typical areas. Each expert chooses in a large district three small areas typical of a small, a medium, and a large system of cultivation. From the average figures obtained from these areas are calculated the average percentage which each crop occupies of the total area of the district. The experts who undertake this duty are required to verify the

accuracy of the figures of cultivated areas by lists which are furnished to them when available. Where such lists are not available they are instructed to judge of the areas under different kinds of cultivation by the eye, and to check the accuracy of their visual judgment by pacing off the boundaries. The finally-ascertained areas and yields of the principal grain crops are published annually after the close of each calendar year by countries and districts in hectares for areas, and in hectolitres and quintals for yields, together with the average yields per hectare, the weight per hectolitre, and with, for comparison, the average figures for the previous decade. An easily-understood diagram accompanies these figures, which, with the decennial average yield represented by 100, shows at a glance the proportion per cent. which each crop in each province and district bears for the year to the decennial average for the whole country.

Information as to the progress of crops during growth is collected monthly from April to October by postcard schedules issued to correspondents selected from the leading agriculturists of each district. There are more than 1,000 of these correspondents, and their services are voluntary. The reports based upon the information they supply are summarised in the form of general remarks, but without any attempt to express conditions numerically, and are published periodically in the organ of the Central Statistical Commission, viz., the *Statistische Nachrichten aus dem Gesamtgebiete der Landwirtschaft*.

Hungary.

The crop reporting system of Hungary, organised by the Hungarian Ministry of Agriculture, depends mainly upon the services of a corps of voluntary correspondents chosen from economists and agricultural experts. They are appointed by the Minister of Agriculture upon the nomination of the governors of their respective departments. The number of competent correspondents is made as large as possible, and so distributed that there shall be at least one correspondent for every 10,000 jocks, equal to about 14,220 acres. The correspondents are furnished with schedules of different colours, and these are returnable to the Agricultural Ministry on the 1st and 15th of each month during the summer period from April to October, and on the 15th of each month from November to March. Telegraphic forms are also supplied to correspondents for the immediate notification of changes due to the weather or other causes affecting the condition of the crops.

The basis of computation of yield is the area of land sown, and this is ascertainable from the communal survey. Relying upon the data furnished by the communal authorities, the Central Statistical Office of the Department of Agriculture makes a triennial survey of the lands sown, and the changes made annually are reported by the agricultural correspondents. Estimates of the yield expected from the principal crops are made twice monthly from June to September as follows. Each correspondent, after obtaining information from his own ordinary correspondents in the district,

estimates the yield of wheat, rye, oats, maize, and potatoes per jock for the district which he serves. The data thus obtained by the Agricultural Department are grouped by administrative districts. The average yield per jock for each district for each crop multiplied by the total area of the crop in the district gives the total production to be expected. The area of each crop is taken as that of the previous year plus or minus the area per cent. which should be added or deducted in consideration of the special circumstances of the season. Thus the area under wheat in 1908 being 6.2 million jocks, a deduction of about 8 per cent. owing to damage by winter frosts, spring drought, and generally unfavourable weather reduces the area by 0.48 million jock, and the anticipated yield is reduced accordingly. In the same way the area under barley is estimated to be increased by about 6 per cent. owing to the sowing with this crop of land that had to be reploughed after the failure of winter wheat.

After the conclusion of the harvest, when the threshing results are known, including those of the large properties, the agricultural correspondents, in the middle of October, prepare their estimates for what will be the final and definite statement of the yields of the principal crops of the year. These are issued as they become available, at the close of the year, or at the beginning of the following year.

In addition to the agricultural correspondents, who number about 2,400, there are in different parts of the country 100 reporters of the ravages of insects. Each reporter is furnished with a small magnifying glass for the purpose of observing the habits of insects affecting farm crops, and the results of those observations are communicated to the State Entomological Station on postcards supplied and franked. The State Entomological Station uses the information thus acquired in devising the necessary official measures to be taken towards combating injurious insects, and especially of giving instructions to the public as to the remedies to be adopted.

Each correspondent is furnished with a copy of "The Agricultural Correspondent's Year-book." This work, a handy octavo volume of about 650 pages, explains the system of the agricultural statistical service, the duties of the correspondents and the plan of procedure, gives information on agricultural questions and laws, the personnel of the Department of Agriculture, the business of each branch, and contains the names and addresses of the correspondents, printed by districts, with the year of appointment in each case, and also alphabetically.

The services rendered by the agricultural correspondents are purely of a voluntary character. The only recompense accorded by the Department takes the form of a subscription to agricultural journals to those who have fulfilled their duties with assiduity during several years, and of "Diplomas of Recognition" to those who have fulfilled them zealously for more than ten years.

A study of Hungarian agricultural statistics shows that present average yields, as officially recorded, are greatly superior to what they were about thirty years ago, and the question has arisen

as to how far this increase is attributable to better methods of statistical collection and how far to improvements in practical agriculture. Major Craigie has kindly favoured me with the perusal of a letter to him from M. de Vargha, Director of Statistics of the Hungarian Ministry of Agriculture, in which this point is discussed. M. de Vargha states that the Hungarian agricultural crop statistics originated in 1868, and that the system of presenting statistical returns from the data obtained was radically altered in 1878. The method employed has progressively improved, and this, in conjunction with the change of system, explains to some extent the higher yields of later years. But in this period there has been also immense progress in Hungarian methods of cultivation. For instance, an inquiry in 1872 showed that out of 1,109,460 ploughs enumerated only 530,525 were of iron, whilst the remaining 578,935 were old and primitive wooden ploughs such as had been used during several centuries. Wooden ploughs are not used at all now, and steam ploughs for deep cultivation are more and more distributed. In a continental climate like that of Hungary, with frequent periods of drought, deep ploughing is of great importance.

Deeper cultivation, the use of drilling machines, properly cleaned seed and better manuring have contributed to the improvement. But M. de Vargha also states and illustrates the point by giving the average yields per hectare of fall wheat—Hungary's principal product—for a long series of years, that crops in Hungary have been subject to cycles of good and bad consecutive seasons. Thus the years between 1870 and 1880 were unfavourable, whilst those between 1890 and 1900 were favourable, almost without exception in each case. Reference to exact records of the landed property of the Royal Hungarian Stud at Mezöhegyes shows that the average yields per hectare of the principal crops have enormously increased owing to the substitution for primitive methods of a really rational and intensive cultivation. For instance, where in the decade 1851-1860 the yields in bushels per acre were only of wheat 10·9, barley 14·7, oats 17·1 and maize 21·3, in the decade 1891-1900 the corresponding figures were: wheat 30·3, barley 43·9, oats 51·3 and maize 41·6, practically a triplication in the case of wheat, barley and oats, and a duplication in the case of maize.⁴

It is admitted, however, by M. de Vargha that the present average yields, as recorded for the whole of Hungary, may have been increased to the extent of about 7 or 8 per cent. in consequence of the statistical reform of 1878.

Russia.

In Russia the statistical service (which is now undergoing revision) is organised by the Central Statistical Committee of the Ministry of the Interior, and information as to crops is obtained by means of schedules filled up by the large landowners and by the

⁴ The quantities are converted from metric quintals to imperial bushels at the following weights per bushel;—Wheat, 60 lb.; barley, 48 lb.; oats, 34 lb.; maize, 56 lb.

small cultivators. Data on the condition of crops during growth have only been collected by the Committee since 1904, and schedules for the purpose are issued by the Committee to the governors of provinces, who arrange for their distribution by police officers. When filled up they are returned direct to the Committee by communal administrators and police. For the collection of data on the areas sown with grain, on meadows, and on the numbers of live stock, schedules are sent through the governors to the communal administrators, by whom they are returned to the Committee in envelopes provided.

The governments and provinces of the empire are divided into three districts according to climatic conditions, the forms being returnable for District I on May 20, for District II on June 5, and for District III on June 20. Similar schedules are distributed to landowners through the police for return to the Committee by the same dates. For the collection of data on the yield of cereals, hay, clover, and fodder crops the Committee, through the governors, send schedules to the communal administrators, who distribute them amongst 6 peasant farmers, choosing 2 well-to-do, 2 of average comfort, and 2 in poor circumstances, all of whom are required to give exact replies to the questions put. The dates for the return of these schedules are fixed as follows: District I, winter cereals August 10, spring cereals August 25; District II, winter cereals August 20, spring cereals September 5; District III, winter cereals September 5, spring cereals September 20. Similar schedules are issued for distribution to private landowners, 12 in each commune, of which 6 are for winter and 6 for spring crops, and are returnable in the same way. Data on the condition of cereals during growth are at present collected for 73 governments and provinces of the empire, but the acreage and yield statistics apply to 91 governments and provinces. The number of communes, 13,973 multiplied by 6, gives the number of cultivators who furnish information on the condition of crops during growth as 83,838, whilst the number of communes in the 91 governments and provinces, viz., 16,748, multiplied by 6, gives the number of cultivators supplying this information as 100,488. In addition there are the private owners, whose number varies from one commune to another. In reporting upon the condition of crops during growth no system of numerical representation is adopted, but the terms "good," "satisfactory," "unsatisfactory," and "bad" are employed.

Reports on crops during growth and estimates of production in European Russia are also issued by the Russian Department of Agriculture with the aid of more than 10,000 correspondents.

Sweden.

Although not a large corn-growing country, Sweden has a well-organised service for the collection of agricultural statistics which deserves mention. Its system of annual crop returns is of ancient origin, dating back to the sixteenth century, and regular records are available from the beginning of the eighteenth century. In 1779 the service was systematically reconstructed, and a revision of

1874 placed it upon its present basis. As now organised, monthly reports on crop prospects during growth and annual preliminary estimates of yield are undertaken by two independent authorities, the former by the Board of Agriculture and the latter by the Central Bureau of Statistics.

The monthly reports on crop prospects date from 1902, and are made during the growing season from May to September. For this purpose Sweden is divided into 319 districts, to each of which is assigned a crop estimator. The estimators are appointed by the semi-official agricultural societies, which are about 26 in number, and which receive subventions from the State. The estimators are furnished with schedules, upon which, at the end of each month, they give, in addition to their general descriptive observations, a quantitative estimate of the crops according to appearance by means of numbers possessing the following significations:—5 = very good, 4 = good, 3 = average, 2 = small, 1 = very small. This scale is in principle similar to that employed by Germany, but the signification of the numbers is reversed. The schedules as completed at the end of the month are returned to the secretary of the agricultural society, by whom they are forwarded within seven days to the Board of Agriculture. The Board publishes the averages (extended to one decimal) for each province and for the whole of the country, together with a summary of the estimators' remarks. The crops reported on are winter wheat, winter rye, barley, oats, mixed cereals, peas and beans, potatoes, sugar beet, hay from temporary meadows and hay from permanent grass.

For the annual preliminary estimates of yield, the country is divided into 518 districts, and for each district an estimator is appointed from amongst inferior administrative officials. These, called *länsmän*, are a kind of sheriff's officer. They estimate the yields of cereal crops in multiples of grains, called *korntal*; that is, according to the number of grains produced by each seed, but without deduction of the seed sown. Other crops are described in general terms, and the estimates are accompanied by remarks. The returns are sent to a superior official,—a revenue officer called *kronofogde*,—who adds his own remarks, and transmits them to the provincial government. The governor expresses a general opinion, according to a prescribed scale, on the total cereals of the province, and sends the returns to the Central Bureau of Statistics before the end of October. From the data thus furnished the Bureau publishes about the middle of November a preliminary crop report, which contains (1) a general description of the crops of each province and of the whole country, based upon the reports received from the provincial governors, and expressed according to a scale of points graded from 10, indicating "plentiful," down to 0, indicating "total failure;" and (2) a quantitative estimate in hectolitres of the yield of cereals, based upon the *korntal* of the sheriff's officers and upon a knowledge of the quantity of seed sown.

A more detailed inquiry into the agricultural production of the year is carried out under the direction of the Central Bureau by the agricultural societies, assisted by communal authorities and special

experts. The results are published in tabular form as they are ready, but a complete report follows, usually towards the end of the ensuing year.

A Royal Commission, which for some time has been considering the whole question of official statistics in Sweden, has issued a report on agricultural statistics, dated May 30, 1908. It is expected that a Government Bill, to give effect to the principal recommendations of this report, will be submitted to the Swedish Parliament early in 1910. The reforms proposed are of a drastic character, but they will not materially affect the present arrangements for crop-reporting. The following are the principal alterations proposed in this connection. Instead of two independent authorities for the reports on crop prospects and the preliminary estimates of yield, both will be entrusted to the Central Bureau of Statistics, and the machinery for their collection will be identical. In both cases the estimators will be appointed by the agricultural societies, and the districts, numbering 302, will, as a rule, be the same as those of the present reports on crop prospects. To the September report on crop prospects will be added an estimate of yield in kilogrammes per hectare for the more important crops. This will enable a preliminary estimate of the year's harvest to be issued during October. The returns will also begin in April instead of May, except for the five northern provinces. As regards the preliminary crop returns, the most important change contemplated is the substitution of estimates in kilogrammes per hectare for the *korntal* or multiples of seed. New data will be collected for recording the average weights per hectolitre and the average prices per 100 kilogrammes. These returns will be required to be sent in before November 25, and the estimates now made by the provincial governors will disappear.

United States.

Turning from Europe to the New World, the United States possess what is probably the oldest and most highly organised system of monthly crop reporting in existence. The principal crops of the United States, notably cotton, maize and wheat, are so greatly the subjects of commercial speculation that experience has proved the value and even the necessity first for the issue of unbiassed official reports, and secondly for the greatest precautions to ensure that such reports are in no way manipulated unfairly to private advantage.

Provision for the collection of agricultural statistics was first made by Congress in 1863, and since that date there has gradually been evolved the system at present in force for the collection and publication of monthly reports on the crops and live stock of the United States by the Bureau of Statistics of the Department of Agriculture. The data for these reports are obtained through the co-operation of different classes of officials and correspondents comprising, in addition to the officials employed within the Bureau itself (a) a field service of 17 or more travelling agents, each reporting for a given group of States; (b) a corps of 45 State

statistical agents, each located in a different State, and (c) a large body of voluntary reporters consisting of county correspondents, township correspondents, individual farmers and special cotton correspondents. The field service consists of experts specially qualified by their statistical training and practical knowledge of crops. Each of the 45 State statistical agents maintains a corps of correspondents entirely independent of those who report direct to the Department of Agriculture at Washington. They cover the State completely, and average in total numbers from 20 to 700 correspondents each, according to the size of the State and its agricultural importance. These correspondents report to the agent on forms supplied, and the agent after due co-ordination and analysis prepares therefrom telegraphic and written monthly reports to the Department.

The county correspondents are 2,685 in number, and each of them maintains an organisation of several assistants, each covering a specified district. The correspondent sends to the Department a monthly report which relates to his county as the geographical unit. Similar procedure is followed in respect of townships and other smaller areas where each township correspondent reports monthly for his own district direct to Washington. The list of township correspondents comprises from 6 to 15 individual correspondents in each county, distributed geographically throughout the county according to its size and productive importance, and their aggregate number is about 33,000. Finally, at the end of the growing season, a large number of farmers (about 25,000) and planters report on the results of their own individual farming operations during the year, and data are also obtained from about 30,000 mills and elevators.

The three different categories of correspondents, viz., State agents and their assistants, county correspondents and township correspondents are kept entirely distinct from each other, and they each present separate reports to the Department covering the same territory and the same crops. From these three independent sources, supplemented by the reports of the travelling field agents, the Bureau of Statistics of the Department of Agriculture prepares the monthly reports. In tabulating the results, careful attention is paid to the weighting of averages, so that duly proportionate results are arrived at for each State and for the United States as a whole. The total number of all classes of correspondents in the crop reporting service aggregates nearly 250,000, and the number of direct returns received by the Bureau month by month during the crop reporting season is approximately 25,000. From 80 to 90 per cent. of the crop correspondents are practical farmers. No money remuneration is paid to county and township correspondents, but seeds, bulbs, and agricultural literature are furnished them. The State agents are paid from \$300 to \$800 per annum, special cotton agents, \$240 to \$600 per annum, and the travelling field agents \$5 to \$7 per diem with travelling expenses.

The method employed by the Bureau of Statistics for the purpose of measuring the relative condition of agricultural crops

is by average numerical percentages above or below what is regarded as a normal or standard condition which is represented by 100. This normal condition is not the average nor the highest possible, but is regarded as a condition higher than the average but lower than the possible maximum. It is such as would accompany a crop starting out under favourable conditions, and not subjected afterwards to unfavourable weather, insect pests, or other injurious agencies. Any deviation from the normal is expressed by a percentage figure above or below 100. If, for instance, the condition is regarded as 10 per cent. above the normal the figure representing it will be 110; if 5 per cent. below the normal the condition will be represented by 95. In the case of live stock the figure 100 is taken in the same way to represent a normal condition of healthfulness, deviations from the normal condition being expressed by average percentages above or below it. The following statement of the percentage condition of the various crops in the United States on August 1, 1909, compared with the previous month, with the corresponding month of the previous year, and with the average for ten years, will serve to illustrate the system:—

Crop.	August 1, 1909.	July 1, 1909.	August 1, 1908.	Ten-year average.
Corn (maize).	84.4	89.3	82.5	82.6
Spring wheat	91.6	92.7	80.7	81.1
Oats	85.5	88.3	76.8	83.1
Barley	85.4	90.2	83.1	86.1
Rye	89.1	91.4	88.3	87.9
Buckwheat	86.3	89.4	—	91.7

The reports on the condition of crops are published during the growing season in the *Crop Reporter*, which is issued monthly by the United States Bureau of Statistics, and which also contains reports on European crops, statements of imports and exports, average prices, and other statistical items.

Canada.

The present organisation for the collection of agricultural statistics in the Dominion of Canada dates from 1905, when the Census and Statistics Office of the Department of Agriculture was reorganised in permanent form by Act of the Dominion Parliament on the basis of the Census Act of 1870. The Office is charged with the duty of taking the decennial census of the Dominion, this census embracing not only the enumeration and classification of the people, but also a comprehensive account of the whole of the productive resources of the country. A quinquennial census of population and agriculture is held for the three rapidly developing north-west provinces of Manitoba, Saskatchewan, and Alberta. In addition, the Census and Statistics Office undertakes intercensal statistical inquiries relating to agriculture, manufactures, or specific industries, as ordered from time to time by the Minister of Agriculture, and

collects and publishes also the annual criminal statistics of the Dominion.

In 1908, under the powers conferred by the Act of 1905, the Census and Statistics Office began a system of monthly reports on the crops and live stock of Canada, under which in future annual agricultural statistical estimates for the Dominion will be available during the intercensal periods. These new statistics cover the areas and yields of the principal agricultural crops, the numbers of live stock, and monthly reports on condition and progress during the season of growth. Previously to the commencement of this system in 1908 there existed no arrangements for the collection and publication annually, under the authority of the Dominion Government, of agricultural statistics for the whole of Canada.

In undertaking this work the first step was the selection and appointment of a body of practical agricultural correspondents throughout Canada to fill up and return the schedules of questions addressed to them monthly from the Census and Statistics Office. The number of correspondents is at present between 2,500 and 3,000, and their services are entirely voluntary.

The crop reports are concerned with (1) the ascertainment of the areas under each of the principal agricultural crops throughout Canada; (2) their condition and progress during growth; (3) the quality, yield per acre, and total yield of each crop by approximate estimates before harvest and by definite estimates after threshing; and (4) ascertainment of the numbers of the different descriptions of live stock, their condition for work (horses and oxen), for milk and beef (cows and cattle), for mutton and wool (sheep), and for pork (pigs). Incidentally inquiries are made, and the results are published, respecting the values of products, the prices of fodder, the wages of farm help, and the stocks of grain in farmers' hands.

For the estimation of crop areas correspondents are requested to enter on the schedules supplied the estimated percentage which each crop occupies above or below its area in the previous year. The area of the previous year being fresh in the mind of the correspondent, he estimates whether the area under wheat, for instance, is 5, 10 or 15 per cent. above or below that figure. If he considers that the wheat area is 10 per cent. larger, he enters 110 in the column provided; if 5 per cent. less, he enters 95. The area for each crop taken as the original datum line is, pending the next decennial census, taken from the best sources of information available, and may in some cases be based upon the figures published by the provincial agricultural department or, as in the north-west provinces, on the census of 1906, or on the figures of the recent special census of 1907 for the eastern provinces. The statistics of crop areas for Canada obtained in this way were published for the first time in July, 1908, and are now available for the years 1907, 1908, and 1909.

For the purpose of expressing the condition of crops during growth the numerical method of the United States Department of Agriculture already described has been taken as a model and adapted to Canadian conditions. That is to say, the condition is expressed

by a numerical percentage above or below a standard condition which is represented as 100. The term "standard condition" denotes a full crop of good quality, which may be above the average of the district, but yet not equal to the maximum under specially favourable circumstances. The grades of condition are divided into five, viz., "full crop," denoted by 100 or over; "good," represented by any figure from 75 to 99; "average," from 50 to 74; "fair," from 25 to 49; and "poor," below 25. This method of ranging the percentage numbers into grades has the advantage of presenting a more definite idea to the mind of the correspondent who, if he cannot, especially at first, accustom himself to the representation of values by percentage numbers, may easily classify the crops he reports on under the corresponding terms "full crop," "good," "average," "fair," or "poor." In addition to their use in conveying a clear and definite idea of the present condition of growing crops the numbers employed lend themselves usefully to purposes of comparison with previous periods.

In September, upon completion of the harvest and commencement of threshing, when the crops are beyond the problematic stage, schedules are issued to correspondents for the purpose of recording the numerical percentage of a standard of quality under the four grades as previously defined, the basis of comparison being a standard of 100 which represents a crop unaffected to any appreciable extent by frost, rust, smut, &c.

In 1908 three preliminary estimates were made as to the expected yields of the principal cereal crops, viz., on July 31, August 31, and September 30. To arrive at these, correspondents were requested to enter the anticipated yield per acre of each crop in their districts, and the resulting averages per acre multiplied by the number of acres gave the total production for each province and for all Canada. Under this plan the total wheat crop on July 31, 1908, was estimated to yield 130.26 million bushels (excluding at this date the Maritime provinces and British Columbia, where, however, wheat is not a very large crop); the second estimate on August 31 gave 124.69 million bushels, and the third estimate on September 30 115.65 million bushels. Drought or frosts during these months caused continued diminution of yield which is reflected in these preliminary forecasts. Finally a careful definitive estimate of yield, based upon actual threshing results, was made on November 30, and this in the case of wheat amounted to 112.43 million bushels. In making this final estimate each correspondent was requested to state the yield for each crop (*a*) upon his own farm and (*b*) on the farms in his neighbourhood, both sets of figures being taken into consideration before finally striking the averages for districts, provinces, and for the whole of Canada. The total yields are obtained by multiplying the acreage of each crop by the average yield per acre, which is in all cases extended to two places of decimals. The production is expressed in bushels for all crops excepting clover and grasses, fodder corn and sugar beet, these being given in short tons of 2,000 lb. The same percentage principle of computation is applied to the enumeration of live

stock, the numbers for 1908 and 1909 being calculated from the average percentages above or below the numbers of the previous year. Monthly reports on the condition of farm animals are made upon the same numerical principle, the number 100 representing a healthy and thrifty state.

Argentine Republic.

In Argentina, now one of the three largest grain-exporting countries of the American continent, there exists a well organised service for the collection of agricultural statistics. The Division of Agricultural Statistics and Rural Economy (*Dirrección de Estadística Agrícola y Economía Rural*) was established as a branch of the Argentine Ministry of Agriculture in 1889. Its work is comprehensive, covering all questions concerned with agricultural wealth, land, capital, labour, production, distribution and consumption. To aid in the collection of agricultural statistics, the Division has enlisted the voluntary services of about 3,000 correspondents, selected from the agriculturists and merchants of each district. Each correspondent represents the smallest unit of area, which in the province of Buenos Ayres is a "cuartel" and in the other provinces a colony or colonised field.

Information relating to crop areas, condition during growth and yield is collected from the local correspondents by the issue to them of schedules as in other countries. The principal Argentine crops are wheat, maize, oats, flax and lucerne, and the first schedules have reference to the areas sown to these crops. In May the areas under lucerne are ascertained; in June information is obtained as to the conditions, favourable or unfavourable, under which the land has been prepared for the sowing of wheat, flax, and oats, and as to the proportionate increase per cent. of the area under each of these crops. In July the condition of the crops under wheat, flax, and oats is ascertained. In August similar information is obtained, but with the addition of definite final particulars as to the areas sown. In September a forecast of the areas sown is published after approval by the General Council, which is composed of the inspectors and registration officials under the presidency of the Chief of the Division. In November the area under maize is ascertained.

Copies of the schedules are usually sent to the correspondents for issue by them to their own local correspondents; but the schedules, as completed and returned by the correspondents of the Division of Statistics, summarise the results so obtained for the whole district. After compilation at headquarters, the following classification of the results is adopted for the purpose of expressing condition, viz., "very good," "good," "regular," and "bad." Whilst these monthly inquiries during growth enable an idea to be formed as to probable yield, a more definite forecast of yield is made in December, when the correspondents are required to give for wheat and flax the average yield per hectare in their districts.

After the completion of the harvest a final estimate is made of the areas and yields of the principal crops, this being accomplished

with a near approach to accuracy through information collected from the owners of threshing machines. All such machines are registered in the Division of Statistics, and the railway companies advise the Division periodically as to the destination of new machines. It is claimed that under the existing arrangements no threshing machine owner escapes the obligation to furnish the Division with the required information, which includes the areas sown and the quantities threshed of each crop. A monthly bulletin is published by the Division, giving all the statistics collected as they become available for publication.

Australia.

In Australia, where conditions are similar in many respects to those of Canada, the Census and Statistics Act, 1905, of the Commonwealth Parliament provides *inter alia* for the collection of agricultural statistics for the whole of Australia by the Government of the Commonwealth acting in conjunction with the governments of the different component States. The question of statistical uniformity has been discussed on the occasion of various conferences between the years 1861 and 1903, but notably at the Statistical Conference of 1906, held at Melbourne, between the Commonwealth Statistician and the statisticians of the component States and of the Dominion of New Zealand. Effect is being gradually given to the resolutions passed by this Conference.⁵

Agricultural statistics are collected direct from occupiers of more than one acre, as in England, and by the agency of the police in the capacity of collectors, as in Ireland and in Russia. The scheme adopted in the case of the State of Victoria may be taken as illustrating the principles which are applied with modifications throughout the Australasian colonies. In Victoria, under the Statistics Act of 1904, annual agricultural statistics are collected by the officers in charge of all police districts on or before March 1 for the year ended the previous December 31. By the Act occupiers are bound to supply the required information under a penalty not exceeding 20*l.*, whilst a penalty not exceeding 50*l.* may be imposed for wrongly divulging the information collected. The collecting officers are furnished with a "collection book" of sixteen folio pages, containing the printed instructions and ruled columns for records of the occupiers' names and addresses, and of particulars relating to land tenure, labour, acreage and produce of crops, live stock, dairy and pastoral produce, bees, ensilage, manures and machinery. Occupiers are required to furnish the total figures of produce, and not the yield per acre. Under this system the yield per acre for each crop is deduced from the total acreage and total yield, instead of the total yield being calculated from the estimated average yield per acre and the total acreage. The collectors' books when completed are returned to the office of the statistician for compilation. At the end of June each year a statement is compiled showing the total

⁵ See *Official Year-book of the Commonwealth of Australia*, No. 1, 1908, pp. 1—16.

stocks of wheat and flour in the State by the issue of schedules to holders of wheat and to flour mills, and of cards to occupiers.

In addition to the annual statistics of agriculture, the Government Statist of Victoria issues pre-harvest forecasts of wheat and oats based upon the replies of correspondents. The method adopted is to send a card to each wheat and oat grower at the end of June, after the sowing, with questions as to the prospects of the crops. From the answers an estimate is made of the coming harvest, and the figures are published early in December.

In South Australia pre-harvest forecasts of wheat, barley and oats are based upon estimates furnished on schedules by the police officers, who also act as collectors of agricultural statistics, and on postcards filled up by selected agricultural correspondents. These postcards are not signed, but reference numbers enable the Office to identify the correspondent where necessary.

In Tasmania forecasts of yield are obtained by the issue of postcards to farmers. On the first occasion 20 per cent., and on the second occasion about 41 per cent. furnished replies.

South Africa.

In the South African Colonies agricultural statistics have been published annually, but changes in the direction of uniformity will doubtless follow political unification. In only one or two cases has any very definite system been organised of crop reporting during growth. In Natal the Department of Agriculture has in operation a system of crop reports and forecasts relating to maize. In describing the progress of this crop the figures 1, 2, 3, 4 are used to represent the conditions "poor," "fair," "average," and "above the average." The averages of the reports received are extended to one decimal point, and therefore a condition represented for instance by 2.7 indicates one that is between "fair" and "average," but nearer "average" than "fair."

India.

In British India memoranda on the areas, prospects and yields of the principal crops, such as wheat, rice, cotton, oilseeds, &c., are issued periodically by the Director-General of Commercial Intelligence, and are published in the *Indian Trade Journal*, a weekly government organ. The estimates of areas and yields are admitted to be only approximations to the truth. The quantitative estimates are often imperfect, and are stated to be too low. Differing methods of crop reporting are applied in each province, and are based upon formulæ prescribed by the provincial authorities. Field to field inspection, experimental crop cuttings, and other methods are employed, but many of the estimates can only be described as of a conjectural nature. In the case of cotton in the Central Provinces, the yield, which is expressed by the people in terms of annas in the rupee, is converted into percentages, 13.3 annas, or a normal crop, being represented by 100, a full crop or 16 annas by 120, and a bumper crop or 20 annas by 150.⁶

⁶ See *Agricultural Statistics of India*, Vol. I, 1906-07, pp. 365-370.

Conclusion.

In all countries that have established any sort of system for recording the progress of growing crops and of estimating areas and yields, dependence has to be placed largely upon the services of correspondents, who, if not practical farmers, must at any rate be well acquainted with the local agricultural situation. As a rule these correspondents give their services voluntarily, but in some countries (France, Austria, Hungary, for instance) honorary distinctions, such as medals or diplomas, are granted for zealous service, and in others special facilities for obtaining agricultural literature. In all cases the correspondents are furnished with copies of the final results of the general compilations, the value of which, doubtless, they are the first to appreciate. In Great Britain, the crop estimators of the Board of Agriculture are paid for their services, but the scale of payment is low. It varies according to the size of the area covered. The estimators are required to visit personally each parish, and to give for that parish a definite estimate of the yield per acre of each crop. They are supervised by two inspectors, who visit them occasionally and report on their work. Where this is unsatisfactory no hesitation is felt in making changes. And such changes are more easily made than in cases where the services rendered are of a voluntary nature. It would, however, in most cases be impracticable to offer pecuniary rewards to agricultural correspondents who supply local information. The small sum available would not be worth the acceptance of the best kind of correspondent whose services it is desirable to obtain. The work of the agricultural correspondent in connection with crop reporting is essentially one requiring the qualities of public spirit and patriotic feeling.

It is curious how universal and inveterate amongst agriculturists is the suspicion that purely statistical inquiries are prosecuted with ulterior motives of additional taxation. In almost every country where the services of agricultural correspondents are enlisted for statistical purposes, or where farmers are requested to fill up schedules, it is found advisable to enter special disclaimers to the effect that the inquiries have no connection with taxation, and that no individual publicity attaches to the information supplied.

One of the difficulties that besets the collection of data by schedules is too frequently the small number of replies in proportion to the number of correspondents. It is obvious that the larger the number of replies the closer can be calculated the averages based thereon. Therefore anything that minimises trouble to practical farmer correspondents, who are asked to fill up schedules in the midst of pressing work, tends to secure greater attention and more numerous replies. In this connection, therefore, the use of prepaid or franked postcards deserves consideration. They involve the minimum of trouble to the correspondent, and they are easily manipulated in office compilation. Where it is considered that the method involves publicity, the cards need not bear the correspondent's name or signature, a number on the card being sufficient to identify the correspondent's name and exact locality at the central

office where the results are compiled and tabulated. This plan has been referred to as followed in South Australia.

With regard to Canada, attention has been limited to the agricultural statistics collected by the Census and Statistics Office of the Dominion Department of Agriculture. But the agricultural departments of the nine provinces of Canada also collect and publish statistics of the agriculture of their respective countries, under differing systems, however, and with varying degrees of completeness and efficiency. There is, in fact, no co-ordination of statistical method as between the provinces themselves or as between the provinces and the Dominion. The consequence is that the provincial records vary in statistical value, and there are frequent material discrepancies between the areas and yields of crops as published by the provinces and those of the same provinces as published by the Census and Statistics Office of the Dominion Department of Agriculture. It is obviously desirable that the government statistical authorities of Canada, central and local, should act in concert to secure uniformity in methods and unanimity in results.

In studying the methods of crop reporting adopted by different countries one is struck by their variety. It is this which makes so difficult for statisticians the presentation of satisfactory international comparisons as regards agriculture. Whatever methods may be adopted, however, it is evident, as has been pointed out by M. Levasseur,⁷ that for the agricultural statistics which are placed officially on final record an accurate knowledge of crop areas, arrived at by careful actual measurements and addition of units is essential to a really satisfactory statistical basis. Such a basis exists in England, in Australia, in France and in some other European countries where the cadastral survey is kept properly up to date. It is also obtained in those countries where the decennial or other periodical census includes, as in the United States and in Canada, detailed information as to the areas under different crops, but in these cases the information so obtained applies only to the census year and where in the intervening years a knowledge of the areas under agricultural crops is sought to be obtained by estimating the percentage increase or decrease as compared with the previous year there is room for a considerable margin of error to creep in before the arrival of the next census to put matters right, and the results of any particular census year may be either considerably above or below the normal, thus introducing another element of difficulty in the institution of comparisons.⁸ Nor can that method be regarded

⁷ *Rapport sur les procédés et les résultats de la statistique agricole dans les principaux états producteurs.* Par M. Emile Levasseur. Paris, 1902, p. 94. See also Notes on the subjects discussed at the St. Petersburg Meeting of the International Statistical Institute. By Major P. G. Craigie. *Journal of the Royal Statistical Society.* Vol. lx, Part iv, December, 1897, p. 741.

⁸ The recently enacted law of the United States making provision for the thirteenth and subsequent censuses provides for a quinquennial census of agriculture and live stock; so that in future the U.S. Bureau of Statistics will be able to readjust its estimates every five years instead of every ten years.

as statistically satisfactory which seeks to obtain an estimate of the agricultural conditions of a large district by applying thereto, as in Austria, the average figures obtained from typical small areas, no matter how carefully these may be calculated.

Absolute uniformity of method is, however, doubtless unattainable under present conditions, for the agricultural statistics of each country must in the first place be collected and compiled to suit local circumstances. In old and thickly populated countries the statistical system represents a gradual evolution, and the methods applied are the result of constant effort and prolonged experience. In new and sparsely populated countries of immense size the means for a strictly ideal statistical computation are lacking, and the same process of gradual education and evolution has to be applied that has brought to their present efficiency and completeness the statistical services of older countries.

In this paper attention has been particularly directed to the methods adopted for reporting the progress of agricultural crops during growth, and for giving official forecasts of yields before, during, or after harvest. The figures thus published, though admittedly approximate, have not only an immediate local value, but are of universal importance. Hence it is desirable that the methods adopted should be founded upon an intelligible and uniform plan. It would be of distinct advantage if some uniform system of measuring the condition of crops, prepared possibly by the International Statistical Institute or by the International Agricultural Institute, could be accepted by the leading civilised countries, either instead of, or as supplementary to, the system which each country now follows.

II.—*The Statistics of Wages in the United Kingdom during the Nineteenth Century.* (Part XVII.) *The Cotton Industry.* Section III. By GEORGE HENRY WOOD, F.S.S.

Bolton and district.

We have not much difficulty in dealing with our information for this district, as on the whole it is consistent, and as far as spinning branches are concerned, sufficient. The card room presents no difficulty, the noticeable feature being that wages have been lower than in other districts consistently from 1883 until the present. In spinning, our difficulty is mainly caused through the change from hand mules to self-actors. We hear of these latter at fairly early dates, and the list still in operation dates from 1858, but hand mules were actually working as recently as three years ago. The details are given in Table 17.

TABLE 17.—BOLTON AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1833-1903.*

Year	1824.	1833.	1837.	1841.	1841.	1842.	1850.	1850.	1850.	1855.	1860.
Authority ..	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutchers, &c.....	—	—	—	—	—	—	—	—	—	—	—
Mixers	—	—	—	—	—	—	—	—	—	—	—
Scutchers.....	—	—	—	—	—	—	—	—	—	—	—
Carding overlookers.....	—	21 5	—	—	—	—	—	—	—	—	—
Strippers and grinders	—	—	—	—	—	—	—	—	—	—	—
Combers	—	—	—	—	—	—	—	—	—	—	—
Draw-frame tenters	—	5 11	—	—	—	—	—	—	—	—	—
Shub-frame tenters	—	5 8 {	—	—	—	—	—	—	—	—	—
Inter-frame tenters	—	5 3 {	—	—	—	—	—	—	—	—	—
Lover and Jack frame tenters	—	5 3	—	—	—	—	—	—	—	—	—
Tenters average	—	—	7 -	—	—	—	—	—	—	—	—
Spinners' overlookers	—	25 3	—	—	—	—	—	—	—	—	—
Spinners	—	28 6	24 6	—	—	—	—	—	—	—	—
Big piecers	31/6, 35/-	—	—	—	—	—	—	—	—	—	—
Chiefly Y.M.	—	—	—	—	—	—	—	—	—	—	—
Little piecers	—	—	—	—	—	—	—	—	—	—	—
L. and G.	—	—	—	—	—	—	—	—	—	—	—
Half-time piecers	—	—	—	—	—	—	—	—	—	—	—
Piecers average	—	4 8	—	—	—	—	—	—	—	—	—
King and throstle overlookers	—	26 5	—	—	—	—	—	—	—	—	—
Winders	—	7 6	—	—	—	—	—	—	—	—	—
Reelers	—	—	—	—	—	—	—	—	—	—	—
Doublers	—	—	—	—	—	—	—	—	—	—	—
Warpers	—	12 9	—	—	—	—	—	—	—	—	—
Weaving overlookers	—	23 7	—	—	—	—	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—	—	—	—	—	—
" 3	—	—	—	—	—	—	—	—	—	—	—
" 4	—	—	—	—	—	—	—	—	—	—	—
" average	—	9 3	—	—	—	—	—	—	—	—	—
" assistants	—	—	—	—	—	—	—	—	—	—	—
Dressers	—	23 10	—	—	—	—	—	—	—	—	—
Sizers	—	—	—	—	—	—	—	—	—	—	—
Warehousemen and packers	—	—	—	—	—	—	—	—	—	—	—
Mechanics	—	—	30 -	—	—	—	—	—	—	—	—
Average of all.....	—	9 3½	—	—	—	—	—	—	—	—	—

* Per loom.

TABLE 17 *Contd.*—BOLTON AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1833-1906.*

Year	1860.	1860.	1863.	1864.	1865.	1866.	1870.	1871.	1874.	1874.	1876.
Authority ..	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Seutchers, &c.....	—	—	—	—	—	—	—	—	—	—	—
Mixers	—	—	—	—	—	—	—	—	—	—	—
Seutchers	—	—	—	—	—	—	—	—	—	—	—
Carding overlookers.....	18 0	—	—	—	35 7	—	—	—	—	—	—
Strippers and grinders	17 0	12/-, 13/-	15 4	15 -	17 -	18 2	17/-, 18/-	18 -	20 7	21 -	33/-, 40/-
Combers	—	—	9 7	8 6	—	10 6	—	11 -	12 0	—	25 - 2/-
Draw-frame tenters	—	—	8 5	—	—	9 3	—	10 7	12 2	11 6	—
Stub-frame tenters	—	—	—	—	—	—	—	10 6	12 0	—	—
Inter-frame tenters	—	—	—	—	—	—	—	—	—	—	—
Rover and Jack frame tenters	—	8 -	12 0	12 0	—	12 6	16 0	14 2	15 6	15 0	—
Tenters' average ..	—	—	—	—	—	—	—	—	—	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
Spinners' overlookers	—	—	—	—	—	—	—	—	—	—	—
Spinners	27 -	34 6	31 4	28 2½	30 -	34 2	40 -	33 7	35 4	30 7	35/-, 40/-
Big piecers	—	—	13 -	6 -	—	—	—	—	—	33 -	—
Little piecers	—	—	—	—	—	—	—	—	—	8 6	—
L. and G.	—	—	—	—	—	—	—	—	—	—	—
Half-time piecers	—	—	8 8	—	—	9 4	—	10 -	10 5	—	—
Piecers' average.....	—	—	—	—	—	—	—	—	—	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
Ring and throstle overlookers	—	—	—	—	—	—	—	—	—	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
Winders	—	10 -	9 -	—	—	10 6	—	11 -	12 -	—	—
Reelers	—	—	—	—	—	12 -	9 -	12 -	12 6	—	—
Doublers	—	—	9 -	—	—	10 6	—	11 -	12 -	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
Warpers	—	—	—	—	—	—	—	—	—	—	—
Weaving overlookers	—	32 -	—	—	—	—	37 -	—	—	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—	—	—	—	—	—
W. and G.	—	—	—	—	—	—	—	—	—	—	—
M. W. and G.	—	—	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—	—	—	—
average	—	5 2*	—	—	—	—	4 9*	—	—	—	—
assistants	—	—	—	—	—	—	—	—	—	—	—
Dressers	—	—	—	—	—	—	—	—	—	—	—
Sizers	—	—	—	—	—	—	—	—	—	—	—
M. M.	—	—	—	—	—	—	—	—	—	—	—
M. M.	—	—	—	—	—	—	—	—	—	—	—
Warehousemen and packers	—	24/-, 26/-	—	—	—	—	28/-, 30/-	—	—	—	—
Mechanics	—	—	—	—	—	—	—	—	—	—	—
Average of all	—	—	—	—	—	—	—	—	—	—	—

* Per loom.

TABLE 17 *Contd.*—BOLTON AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1833-1906.*

Year	1886.	1891.	1895.	1900.	1906.	1906.		1906.	
						2 ^a Combined.			
Authority ...	17.	17.	17.	17.	17.	No.	Wage, s. d.	No.	Wage, s. d.
Seutchers, &c.....	10 6	11 6	11 6	12 -	12 8	—	—	—	—
Mixers	—	—	—	—	—	63	20 8	63	20 8
Seutchers.....	—	—	—	—	—	55	23 5	55	23 5
Cantling overlookers.....	—	—	—	—	—	152	38 5	174	38 7
Strippers	19 8	24 8	26 1	29 5	30 7	212	29 5	218	29 3
Combs	12 9	13 10	14 5	15 5	16 -	—	—	—	—
Draw-frame tenters.....	12 11	14 10	15 5	16 1	16 10	409	17 2	487	17 2
Slub-frame tenters.....	12 10	14 7	15 -	15 10	16 3	263	17 6	316	17 3
Inter-frame tenters	—	—	—	—	—	329	17 4	419	17 2
Rover and Jack frame tenters	15 6	17 7	18 2	19 1	19 11	227	16 6	1,278	18 8
Tenters' average	—	—	—	—	—	1,051	19 2	2,500	18 -
Spinners' overlookers	—	—	—	—	—	2,052	18 3	415	16 8
Spinners	33 5	38 1	39 11	41 7	43 -	101	43 6	115	43 9
Big piecers	—	—	—	—	—	1,806	45 9	452	47 6
Little piecers	—	—	—	—	—	1,789	15 9	424	15 -
L and G.....	—	—	—	—	—	1,778	10 7	436	9 9
Half-time piecers	—	—	—	—	—	—	—	—	—
Piecers' average.....	9 10	11 4	11 4	12 2	12 3	3,567	13 -	860	12 4
Ring and throstle overlookers	—	—	—	—	—	—	—	—	—
Winders	11 6	12 6	13 6	14 9	15 3	290	14 3	290	14 3
Reelers	13 6	13 6	13 6	14 -	14 -	1,139	13 7	1,359	13 7
Doublers	—	—	—	—	—	340	12 10	489	12 6
Warpers	11 6	12 6	13 6	14 9	15 3	187	13 5	235	13 2
Weaving overlookers	—	—	—	—	—	129	17 10	40	16 8
Weavers, 2 looms	—	—	—	—	—	139	43 4	52	43 9
W and G.....	—	—	—	—	—	—	—	—	—
W and G.....	—	—	—	—	—	—	—	—	—
M.W. and G.....	—	—	—	—	—	—	—	—	—
3	—	—	—	—	—	2,866	18 3	1,417	15 9
4	—	—	—	—	—	—	—	—	—
average	—	—	—	—	—	—	—	—	—
assistants	—	—	—	—	—	—	—	—	—
Dressers	—	—	—	—	—	—	—	—	—
Sizers.....	—	—	—	—	—	16	42 3	16	42 3
Warehousemen and packers.....	—	—	—	—	—	220	24 3	268	24 6
Mechanics	—	—	—	—	—	106	34 8	127	34 10
Average of all.....	—	—	—	—	—	18,872	18 7	24,547	18 2

We have some material which could not easily be tabulated in this table. In the *Quarterly Review*, of 1859, it is stated that the Preston spinners in 1836 struck for the Bolton rate of 26s. 6d. Chadwick, in 1859, gave the following details on the authority of Mr. Ashworth:—

Spinners' average wages, 1842-59.

Year.	400 spindles each mule.							
	Per 20 lbs.		Gross.		Piecers.		Net to spinners.	
	s.	d.	s.	d.	s.	d.	s.	d.
1842	4	7	36	—	16	—	20	—
'46	4	11	38	—	16	—	22	—
'50	4	4	35	6	16	—	19	6
'59	5	1	41	—	16	—	25	—
On "double-decked" mules.								
'59	3	11½	59	10	29	—	30	10

These particulars relate to self-acting mules. Double-decking is often heard of in Factory Inspectors' Reports, and means the coupling up of two pairs of short mules under the control of one spinner. At one time it was frequently adopted as a means of competition with long mules, but it never really was sufficiently in vogue appreciably to affect the average wage. Double-decked mules are still to be found in various parts of Lancashire, but not to any great extent. The most important point in this table is the evidence of an advance after 1842, the reduction and the considerable advance between 1850 and 1859.

Speaking in the debate on the Factory Act, 1844, John Bright gave the following particulars relating to Ashworth's, Bolton:—

	Number.	Average.	
		s.	d.
Males, 13—16 years	126	4	8½
„ 17—21 „	97	9	5⅜
„ 21 years and upwards	136	21	2¼
Females, 13—16 years	113	4	8
„ 17—21 „	135	6	7
„ 21 years and upwards	68	8	9½
Total	675	9	5⅞

Piecers' wages at Bolton have always been a matter of individual bargaining between the spinner and piecer, and piecers' wages are and always have been lower there than elsewhere. Attempts have been made on several occasions to standardise the piecers' wages, and in 1908 a scale was decided on. In 1870 the details of a scheme

drawn up by the self-actor minders throws some light on the earnings of that time. They suggested that the earnings should be not less than :—

	Spinner.		Piecer.		Creeler.	
	s.	d.	s.	d.	s.	d.
For 500 spindles	25	—	9	6	6	6
" 600 "	27	6	10	6	7	—
" 700 "	30	—	11	6	7	6
" 800 "	32	6	12	6	8	—
" 900 "	35	—	13	6	8	6
" 1,000 "	37	6	14	6	9	—

This scale, however, never came into practice.

In 1884, Mr. J. T. Fielding, the operatives' secretary, gave the U.S.A. Consul the following statement of the "actual average of all mules, good and bad, within two miles radius round Bolton":—

Spindles.	Wages, net.		Number of piecers.		Wages of piecers.					
	Hand mules.	Self-actors.	Hand mules.	Self-actors.	Hand mules.	Self-actors.				
	s.	d.	s.	d.	s.	d.	s.	d.		
600 and under	32	—	30	6	2	2	19	—	19	—
602— 750	35	6	31	2	2	2	20	—	20	—
752— 800 ...	38	—	29	3	3	2	26	—	21	—
802— 850	39	—	30	2	3	2	26	—	21	6
852— 900	36	—	33	10	3	2	26	—	21	6
902— 950	42	—	36	4	3	2	26	—	22	—
952—1,000	38	6	37	—	3	2	26	—	22	6
1,002—1,050	40	—	39	—	3	2	26	—	22	6
1,052—1,100	35	9	40	3	3	2	20	—	23	—
1,102—1,150	—	—	39	3	4	3	39	—	26	—
1,152 and up	38	6	44	6	4	3	39	—	31	—

The bulk of the spinners were stated to have from 900 to 1,050 spindles. Except on the very long mules the earnings of hand mule spinners were appreciably higher than those of self-actor minders.

In weaving, besides the ordinary calico woven on narrow looms, Bolton is a centre for the weaving of quilts, &c., on broad looms. The earnings per loom on the broad looms are so much higher than on the narrow looms that their inclusion or omission makes a considerable difference to the average. The only weaving record we have, given on the authority of Mr. George Lord, merely states the average per loom. Bolton averages have never been high, and Mr. Lord's figures suggest that they may include the broad looms. In any case, it is necessary to know the averages separately, and they have been omitted from Table 17, so they may be given here in more detail:—

TABLE 18.—Weaving, Bolton and district.

Omitting broad looms.												
	1886.			1906.				1906.				
	Number.	Average.		Bolton.		Leigh.		District.				
		s.	d.	Number.	Average.	Number.	Average.	Number.	Average.			
2 looms	589	10	10½	928	13	4	461	10	9	1,389	12	6
3 „	359	15	9	1,212	18	1	337	15	9	1,549	17	7
4 „	711	17	4	644	22	11	649	20	—	1,293	21	6
All	1,659	14	10	2,784	17	7	1,447	15	9	4,231	17	1
Looms per weaver.....	3·07			2·86		3·13		2·95				
Average per loom	4/9¼			6/2·2		5/4·2		5/9·6				
Including broad looms.												
1 loom.....	173	12	10	—	—	—	—	—	—	—	—	—
2 looms	641	12	4	1,010	15	9	461	10	9	1,471	14	3
3 „	359	15	9	1,212	18	1	337	15	9	1,549	17	7
4 „	711	17	4	644	22	11	649	20	—	1,293	21	6
All	1,884	15	—	2,866	18	3	1,447	15	9	4,313	17	7
Looms per weaver.....	2·85			2·8		3·13		2·9				
Average per loom	5/3¼			6/6¼		5/4·2		6/0·6				

The advance in average earnings between 1886 and 1906 is thus found to be greater if the broad looms are included than if omitted. On the assumption that Lord's 5s. 9d. per loom in 1883 includes some broad looms, and that the number of looms per weaver increased from 2·2 in 1850 to 2·85 in 1886, we get the following as our weavers' averages at various years:—

	1833.	1850.	1860.	1870.	1877.	1883.	1886.	1906.
Average per loom	—	4/7	5/2	4/9	5/9	5/6	5/3¼	6/0·6
Looms per weaver....	—	2·2	2·4	2·7	2·8	2·8	2·85	2·9
Average per weaver	9/3	10/1	12/5	12/10	16/1	15/5	15/-	17/7

The trade union stated the average wage in 1892 as 20s., presumably referring to the four-loom weaver, and not including girls.

In the census of 1833 the average wage of all employed was 9s. 3½d.; in 1886, 14s. 11d., and in 1906, 18s. 2d. for those working full time, and 17s. 10d. for all employed. These figures relate to

September. Taking the mean numbers paid wages and the amounts paid on the last pay day in each month the average was 17s. 10d. This may be compared with the averages from the similar monthly returns in the *Labour Gazette*, viz. :—

	s.	d.		s.	d.		s.	d.
1905	17	1½	1907	18	7	1909	18	4
'06	17	10½	'08	18	3	(January to August)		

Working out the intermediate years from the tabulated details we get the following index numbers representing the changes in average wages of cotton operatives in the Bolton district, 1833 to 1906. (1886 = 100):—

TABLE 19.

1833	62½	1863-64	80½	1886	100
'36	63½	'66	89½	'91	110½
'40-41	65½	'71	93	'96	113
'46	68½	'74	101½	1900	119
'50	67½	'77	106½	'06	121½
'55	71½	'80	101½		
'60	81½	'83	103½		

Ashton-under-Lyne and district.

This is a cotton spinning district of sufficient importance to make it very regrettable that we have very little material about wages, and that what we have is practically confined to the period 1833-41, and to 1886 and 1906. The details are given in Table 20 and call for no comment. Spinners' wages are mainly governed by the local list; the counts spun average lower than 40s, and the average earnings are the same as at Oldham, viz., 41s. 10d., and only 6d. per week higher than the average for Lancashire and Cheshire. Except that weavers' earnings are rather lower, this correspondence of the spinners' average to the average of the Lancashire and Cheshire area is typical of practically all the occupations.

We learn from the *Quarterly Review* of 1859 that in 1829 3,000 persons in Ashton and Stalybridge were involved in a ten weeks' strike by the coarse spinners, who earned from 28s. to 31s. This apparently had some connection with a strike at Manchester at the same date. The fine spinners were stated to have been earning from 30s. to 35s. at that time.

We are not able to obtain any very useful index numbers from our details for this district. The series indicates—

1833	65	1840-1	63½	1906	119½
'36	67½	'86	100		

The numbers for 1833-41 do not vary greatly from those for the Oldham district, and between 1886 and 1906 the advance, namely, 19 per cent., is again not unlike the 21 per cent. for Bolton and 22 per cent. for Oldham. The changes in piece price levels have almost invariably followed those at Oldham for the past thirty years, so that unless some extraordinary occurrence has altered the

TABLE 20.—ASHTON-UNDER-LYNE AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1833-1906.*

	Year	1833.	1836-37.	1841.	1836-37.	1841.	1836-37.	1841.	1841.
	Authority	4 & 40.	54a.	54a.	54b.	54b.	54c.	54c.	54d.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Carding overlookers.....	M.	20 10	—	—	—	—	—	—	—
Strippers and grinders	M.	—	—	—	—	—	—	—	—
Draw-frame tenters	W.	7 9	—	—	—	—	—	—	—
Slubber tenters	W.	8 -	—	—	—	—	—	—	—
Intermediate tenters ...	W.	—	—	—	—	—	—	—	—
Roving tenters	W.	8 6	—	—	—	—	—	—	—
Tenters' average	W.	—	—	—	—	7/-, 12'6*	—	—	—
Spinning overlookers ...	M.	25 11	—	—	—	—	—	—	—
Spinners	M.	20 8	27 -	24 0	24/-, 26/-	22'-, 25/-	27'-, 30/-	24 -	17/-, 21/-
Big piecers	L. and M.	5 6 {	9/-, 7/-,	9'-, 7'-,	—	—	—	—	—
Little piecers	L.	5 6 {	5'-	5'-	—	—	—	—	—
Piecers' average.....	L. and M.	5 6	—	—	—	—	—	—	6 4
Scavengers	L.	3 7	—	—	—	—	—	—	—
Throstle and ring } spinners	W. and G.	8 6	—	—	—	—	—	—	—
Weaving overlookers ...	M.	22 8	—	—	—	—	—	—	—
Warpers	W.	10 2	—	—	—	—	—	—	—
Reelers	W. and G.	—	10 -	7 9	—	8/-, 11/-	10 0	7 9	—
Weavers, 2 looms	W. and G.	—	—	—	—	—	—	—	—
" 3 "	W. G. & L.	—	—	—	—	—	—	—	—
" 4 "	W. and M.	—	—	—	—	—	—	—	—
" average	—	10 11	10 6	10 6	—	—	—	—	—
Dressers	M.	24 3	—	—	—	—	—	—	—
Average of all.....	—	10 7½	—	—	—	—	—	—	—

	Year	1837.	1841.	1877.	1886.		1906.		1906.
	Authority	54e.	54e.	17.	1.		2.		17.
		s. d.	s. d.	s. d.	No.	Aver.	No.	Aver.	s. d.
Carding overlookers.....	M.	—	—	—	113	34 4	75	40 1	—
Strippers and grinders...	M.	—	—	23 -	368	21 5	186	30 10	31 -
Draw-frame tenters	W.	—	—	15 10	416	16 2	278	21 5	21 6
Slubber tenters	W.	—	—	17 10	—	—	150	20 11	21 6
Intermediate tenters ...	W.	—	—	16 9	1,527	15 10 {	198	20 2	19 -
Roving tenters	W.	—	—	—	—	—	663	19 5	—
Tenters' average	W.	—	—	—	1,943	15 11	1,409†	20 4†	—
Spinning overlookers ...	M.	—	—	—	84	36 6	72	42 10	—
Spinners	M.	20/2, 27/4	39 -	—	1,321	31 1	1,265	41 10	42 6
Big piecers	L. and M.	—	16 -	—	1,234	14 2	1,280	17 11	18 -
Little piecers	L.	—	9 6	—	814	9 8	1,131	11 5	10 6
Piecers' average.....	L. and M.	—	12 9	—	2,043	12 5	2,411	14 11	14 3
Scavengers	L.	—	—	—	366	3 6†	—	—	—
Throstle and ring } spinners	W. and G.	—	—	—	105	12 11	227	14 10	—
Weaving overlookers ...	M.	—	—	—	208	37 4	164	42 2	—
Warpers	W.	—	—	—	176	17 9	92	19 7	—
Reelers	W. and G.	—	—	—	1,779	12 11§	1,068	13 9§	—
Weavers, 2 looms	W. and G.	—	—	—	1,255	11 1	849	12 4	—
" 3 "	W. G. & L.	—	—	—	3,168	16 19	2,575	17 10	—
" 4 "	W. and M.	—	—	—	1,476	20 6	645	21 11	—
" average	—	—	—	—	5,899	16 6	4,069	17 4	—
Dressers.....	M.	—	—	—	66	38 10	17	43 1	—
Average of all.....	—	13 6	12 -	—	18,319	16 3	14,452	19 5	—

* Unchanged since 1832.

† Including 120 tenters unclassified at 21s. 9d.

‡ Half time.

§ Reelers and winders combined.

normal course of wages (and of this we have no evidence) it is not improbable that the course of wages at Ashton-under-Lyne and district has been similar throughout to the course of wages at Oldham. In 1886 the average of all employed was 16s. 3d. In 1906 the average of those working ordinary full time was 19s. 5d., and that of all workers, including those who worked more or less than full time, was 19s. 3d., and the average as shown by the numbers employed and wages paid at the last pay-day in each month was 19s. 2d. The averages shown by the similar figures in the *Labour Gazette* since 1905 have been—

	s.	d.		s.	d.		s.	d.
1905	19	5	1907	20	—	1909	18	9
'06	19	7	'08	18	7	(January to August)		

Stockport and Neighbourhood.

As at Ashton, so at Stockport, there is a considerable amount of material for the period 1833-42, and practically no further information until the Census of 1886. Before 1833 we have a statement which is of value, and some general information difficult to fit into any scheme, yet of interest in itself. The general tabulation of the details is given in Table 21.

Spinning.—A witness to the Commission on Artizans and Machinery, stated that in 1814, 3d. per lb. was paid to jenny spinners for spinning number 12's, and that working 14 hours a day the earnings were 24s. a week. In 1818 the price had fallen to 2½d. per lb. and the earnings to 15s., 16s. A strike took place for an advance to 3d. per lb. but presumably it was unsuccessful, as in 1824 the price was still 2½d. but the earnings had advanced to 17s. 6d., 18s. and 19s. a week. As has already been pointed out,⁶ the range of spinners' earnings was so great during the early years of the industry that these low rates do not necessarily conflict with those of first-class spinners given for corresponding years in the tables.

In 1842 the intense depression of trade caused several comparisons of wages with previous years to be made, and in the Report of the Assistant Poor Law Commissioners (XXXV of 1842) we learn that reductions in spinning prices per 1,000 hanks had been made from 2s. 11d. in 1839 to 2s. 6d. in 1841, and 2s. 1d. in 1842 for precisely the same work, and that this 30 per cent. reduction was "about the general rate for spinning." The same authority gives the reduction in the card room as 7½ per cent. since 1839, and 9 or 10 per cent. in weaving. In 77 firms, in 1836, 8,775 operatives averaged 12s. 9¼d. per week, and in 1841, 8,381 averaged 11s. 1½d. when working full time. Much short time was worked, however, and there was a "six weeks' turnout." The average reduction between 1835 and 1842 is said by this authority to have been 15 per cent. on the 1842 wages, and Cooke Taylor, in his "Tour through the manufacturing districts of Lancashire," says, that in 1834-36 trade was prosperous and wages were high, and that since 1836 there have been reductions

⁶ See Part XV, Section II. *Journal of the Royal Statistical Society*, February, 1910, p. 134.

equal to 15 or 20 per cent. In 1853 a famous successful strike for an advance of 10 per cent. took place.

The averages based on full-time workers, namely—

	s.	d.		s.	d.		s.	d.
1833	10	11	1841	11	1½	1906	19	2
'36	12	9	'86	13	11			

indicate that between 1833 and 1886 wages in the Stockport district did not advance as quickly as in most other parts of Lancashire and Cheshire. In 1833 the averages at Hyde and Stockport were higher than at any other centre, and the average of all three places (10s. 11d.) was higher than at any other district. In 1886 the average was 1s. 4d. per week under the average for Lancashire and Cheshire, and in 1906 seven districts have a higher average. Between 1886 and 1906 the advance per head was 38 per cent., which is so much above that of the industry as a whole that it suggests that the 1886 average was too low.

At the census of 1906 the average wage for all full-time workers was 19s. 2d., for all workers 19s., and the mean average of all for the year, as indicated by twelve monthly statements of total numbers and wages paid, was 18s. 7d. With this latter figure the similar monthly returns in the *Labour Gazette* may be compared as follows :—

	s.	d.		s.	d.		s.	d.
1905	18	4	1907	18	10½	1909	18	1½
'06	18	9½	'08	19	1	(January to August)		

The index numbers indicated by these averages are :—

1886 = 100.					
1833	78½	1841	80	1906	137½
'36	91½	'86	100		

North and North-East Lancashire districts.

Preston, Blackburn, Darwen, Accrington, Chorley, Clitheroe, &c.

It has been found advisable for several reasons to tabulate the details relating to all these centres together. In the first place weaving is the chief branch of the trade carried on in the district, practically all of it under the uniform list which superseded the local lists in 1892, so that except that there are some six-loom weavers in the Blackburn district and none in the Preston district, the conditions of labour are very similar, and the wages of the most important class of operatives may be expected to approximate closely. Again, there is only one Employers' Association for the whole district, and the general changes in wages arranged by it have affected each centre. These reasons would, in themselves, be sufficient to make it more convenient to tabulate the details for the various towns together, but, in addition, friends in this district who have very kindly sent me details relating to their mills have stipulated that these details must not be published in any form which would lead to their identification. As indication of the particular centre might lead to identification, I have made the district allusion as

TABLE 21.—STOCKPORT AND DISTRICT. *Average earnings of cotton operatives for an ordinary week's work, 1816-1906.*

Year	1816.	1820.	1824.	1826.	1831.	1833.	1833.
Place	Hyde.	Hyde.	Stock-port.	Hyde.	Hyde.	Stock-port.	Hyde.
Authority.....	3.	3.	42.	3.	3.	4 and 40.	4 and 40.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Carding overlookers.....	—	—	—	—	—	23 8	20 6
Strippers	—	—	—	—	—	—	—
Grinders	—	—	—	—	—	—	—
Draw-frame tenters	—	—	—	—	—	7 8	6 4
Slubber tenters	—	—	—	—	—	8 —	8 6
Intermediate tenters	—	—	—	—	—	—	—
Roving tenters	—	—	—	—	—	9 4	8 5
Tenters, average	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	26 3	30 4
Spinners, 1st class.....	37 —	35 6	—	35 —	34 9	—	—
" 2nd "	30 —	27 3	—	27 —	28 —	—	—
" 3rd "	—	—	—	—	19 8	—	—
" average.....	—	—	—	—	—	24 3	23 9
Big piecers	—	—	—	—	—	—	—
Little piecers	—	—	—	—	—	—	—
Piecers' average	—	—	—	—	—	5 10	4 7
Scavengers	—	—	—	—	—	3 4	3 7
Throstle spinners	—	—	—	—	—	8 4	8 7
Warpers	—	—	—	—	—	12 4	12 7
Twisters-in	—	—	—	—	—	—	—
Weaving overlookers	—	—	—	—	—	29 7	25 8
Weavers, 2 looms	—	—	—	—	—	—	—
" 3 "	—	—	—	—	—	—	—
" 4 "	—	—	—	—	—	—	—
" average	14 —	14 —	9½, 10½	13 —	12 —	10 8	11 1
Dressers	30 —	30 —	—	30 —	30 6	29 1	28 9
Average of all.....	—	—	—	—	—	11 —	11 4

Year	1833.	1835.	1838.	1841.	1842.	1844.
Place	Glossop.	Hyde.	Hyde.	Hyde.	Stock-port.	Hyde.
Authority.....	4,040.	3.	3.	3.	54.	3.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Carding overlookers.....	21 6	—	—	—	—	—
Strippers	—	—	—	—	10½, 12½	—
Grinders	—	—	—	—	11½, 14½	—
Draw-frame tenters	7 4	—	—	—	7½, 8½	—
Slubber tenters	7 9	—	—	—	—	—
Intermediate tenters	—	—	—	—	—	—
Roving tenters	7 11	—	—	—	—	—
Tenters' average	—	—	—	—	{ 8½ to 9½ 9½ to 11½ }	—
Spinning overlookers	30 5	—	—	—	—	—
Spinners, 1st class.....	—	—	—	—	—	—
" 2nd "	—	—	—	—	—	—
" 3rd "	—	—	—	—	—	—
" average	22 11	—	—	—	20½ to 24½	—
Big piecers	—	—	—	—	12 —	—
Little piecers	—	—	—	—	—	—
Piecers' average.....	4 11	—	—	—	—	—
Scavengers	3 5	—	—	—	—	—
Throstle spinners	8 8	—	—	—	8½, 10½	—
Warpers	18 —	—	—	—	—	—
Twisters-in	—	—	—	—	12 —	—
Weaving overlookers	31 1	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—
" 3 "	—	—	—	—	—	—
" 4 "	—	—	—	—	—	—
" average	11 6	12 6	11 —	9 9	11 —	11 —
Dressers	28 10	—	—	—	{ 20½, 25½, 26½, 30½ }	—
Average of all.....	10 1	12 9½*	—	11 1½*	—	—

* From Authority 54, and refers to the district.

TABLE 21 *Contd.*—Average earnings of cotton operatives, Stockport district.

Year	1858.	1886.		1891.	1906.	
Place	Stockport.	District.		Hyde.	District.	
Authority.....	12b.	1		11.	2.	
	s. d.	No.	Aver.	s. d.	No.	Aver.
Carding overlookers.....	32 6	43	31 8	—	50	38 10
Strippers	—	103	19 6	—	63	29 9
Grinders	—					
Draw-frame tenters.....	—	118	13 -	—	155	21 5
Slubber tenters	—	466	14 -	—	130	19 11
Intermediate tenters	—				187	19 5
Roving tenters	—	584	13 10	—	388	19 9
Tenters' average	—				860	20 -
Spinning overlookers	—	29	36 1	—	37	42 4
Spinners, 1st class	—	—	—	39 -	54	49 4
„ 2nd „	—	—	—	36 -	172	49 11
„ 3rd „	—	—	—	30 -	417	37 5
„ average	23 -	304	31 2	—	643	41 3
Big piecers	—	288	13 4	—	559	17 7
Little piecers	—	223	9 1	—	447	11 4
Piecers' average.....	—	511	11 6	—	1,006	14 10
Scavengers	—	47, 18†	5/5, 3/-†	—	—	—
Throstle spinners	—	229	11 1	—	396	15 1
Warpers	—	44	17 2	—	156	20 3
Twisters-in	—	M. 14	19 7	—	24	22 5
		W. 21	16 -		—	—
		All 35	17 5		—	—
Weaving overlookers	—	61	35 2	—	116	42 7
Weavers, 2 looms ..	—	450	10 10*	—	381	11 6
„ 3 „	14 6	414	15 11	—	520	19 1
„ 4 „	—	724	18 6	—	1,986	22 2
„ average	—	1,588	15 8*	18 -	2,887	20 3
Dressrs	30 -	18	36 7	36 -	22	41 5
Average of all.....	—	6,072	13 11	—	9,721	19 2

* Excluding 8 men at 20s. 1d. and 109 women at 13s. 4d. on special goods. Their inclusion raises the average for 2-loom weavers to 11s. 5d., and reduces the average of all weavers to 15s. 6d.

† Half-timers.

vague as possible. Over and above this, there has been rescued from the pulping mill an old “average” book, such as is kept in one form or another by practically all manufacturers, and while from internal evidence it is certain that it relates to some part of the North and North-East Lancashire district, it affords no indication as to the particular centre. Its value in conjunction with the other information as to weaving, winding, warping, &c., is so great that we should have to use it in comparison with the other details for the Preston, Blackburn and Accrington districts. The record marked C in Table 22 is from this source. The significance of the figures is discussed later.

The tabulation of the detailed statements of wages in these districts is given in Table 22.

TABLE 22.—Average earnings of cotton operatives for an ordinary week's work at PRESTON, BLACKBURN, DARWEN, and other NORTH and NORTH-EAST LANCASHIRE CENTRES, 1836-1906.

Year	1836.	1841.	1842.	1842.	1845.	1850.	1855.	1855-61.	1858.	1860.	1860.	1861.	1863.	1866.	1870.	1871.
Place	Pres- ton.	—	*	—	—	—	—	Black- burn.	Black- burn.	Pres- ton.	—	Dar- wen.	Black- burn.	—	Pres- ton.	Black- burn.
Authority	Ward.	—	54.	—	17.	17.	17.	3A.	12B.	17.	17.	B.	3.	17.	20.	9.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Mixers, M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Scutchers, M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Blowing, &c., W. and G.	15 6	5 —	—	6 6	12 3	6 6	6 —	8 6	—	8 9	8 9	—	10 —	11 3	—	18 —
Carding overlookers.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Strippers	10 —	10 —	9 ^a 10/-6	10 3	10 3	10 6	10 6	14 —	—	14 6	14 6	—	15 —	19 3	15 —	16/-, 18/-
Grinders	6 6	6 6	7 6	8 —	8 —	7 6	7 6	11 —	—	10 3	10 3	—	10/6, 11/-	12 9	—	12/6, 13/6
Drawers	7 3	7 3	7 —	8 6	8 6	7 —	7 —	11 —	—	12 —	12 —	—	11/-, 12/-	11 3	—	15/-, 16/6
Slubbers	7 6	7 6	7 —	8 6	8 6	10 —	10 —	—	—	—	—	—	—	—	—	—
Intermediates	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Intermediate	8 6	7 1/2, 7/6	7/6, 8/6 d	10 3	8 3	10 3	10 3	13 —	—	10 9	10 9	—	12/-, 13/6	13 3	—	16/-, 18/-
Rovers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All tenters	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Little tenters	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spinners	22 6	26 6	26 3	20 6	20 6	15 3	15 3	24/-, 35/-	—	21 9	21 9	—	20/-, 30/-	7 6	11 —	8/-, 9/6
Big piecers	—	9 9	9 9	9 9	9 9	10 —	10 —	15/-, 18/-	21 —	10 3	10 3	—	16/-, 24/-	27 —	24 —	30/-, 40/-
Little piecers	—	6 —	6 —	6 —	6 —	6 6	6 6	5/6, 6/3	—	7 6	7 6	—	6 6	7 6	—	13/-, 16/-
Piecers' average	5 6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Throstle overlookers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Throstle spinners	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Winders	9 3	9 3	7 3	8 9	8 9	9 3	9 3	10 6	—	10 —	10 —	—	9/-, 11/-	13 9	9 —	12/-, 14/-
Warpers	10 —	10 —	7 9	11 3	11 3	9 9	9 9	13 —	—	12 9	12 9	—	10/-, 18/-	16 3	—	—
Twisters-in	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Weaving overlookers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" 4 "	3 —	3 —	—	—	—	—	—	10 6	—	—	—	—	9/-, 10/-	—	—	30/-, 40/-
" 6 "	4 —	4 —	—	—	—	—	—	15 9	14 0	—	—	—	13/-, 15/-	—	—	11

TABLE 22. *Conc.*—Average earnings of colon operatives for an ordinary week's work at PRESTON, BLACKBURN, DARWEN, and other NORTH and NORTH-EAST LANCASHIRE CENTRES, 1836-1906.

[illegible]

* Half-timers.

Including half-timers.

I Excluding half-timers.

TABLE 22 *Contd.*—Average earnings of cotton operatives for an ordinary week's work at PRESTON, BLACKBURN, DARWEN, and other NORTH and NORTH-EAST LANCASHIRE CENTRES, 1836-1906.

Year	1894.	1897.	1900.	1901.	1905.	1906.	1906.	1906.	1906.	1906.	1907.	1908.
Place	—	—	—	Black- burn.	—	—	Preston.	Blackburn district.	Accrington district.	Blackburn and Accrington.	—	—
Authority.....	17.	17.	17.	17.	17.	17.	2.	2.	2.	2.	17.	17.
Mixers, M.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutchers, M.	—	—	—	18/-	—	—	14	37	—	—	—	—
Blowing, &c., W. and G.	13 6	13	15 3	18/-, 21/-	16 9	16 9	46	56	—	—	16 9	16 9
Carding overlookers.....	30 —	29 9	30 3	40/-, 50/-	30 3	31 3	—	—	—	—	34 9	34 —
Stripper.....	23 —	23 9	25 9	21 —	28 3	28 3	40	36	25 8	94	28 6	28 3
Grinders.....	15 —	14 6	16 9	18 —	18 3	18 3	54	72	27 1	—	18 3	18 3
Drawers.....	16 9	17 3	19 9	20 —	20 9	20 6	130	140	19 10	—	21 —	21 3
Slubbers.....	16 9	17 3	19 9	21 —	20 9	20 6	135	131	18 4	—	21 —	21 3
Intermediates.....	19 —	19 6	21 9	21 —	22 9	22 3	323	292	20 5	—	23 —	23 —
Rovers.....	—	—	—	—	—	—	699	672	20 2	802	—	—
All tenters.....	8 9	9 6	10 9	8/-, 9/-	11 3	11 0	—	—	130	22 9	11 6	11 6
Little tenters.....	—	—	—	—	—	—	—	—	—	—	—	—
Spinning overlookers.....	31 3	33 9	36 3	35 —	38 6	38 6	28	32	39 6	884	40 —	39 3
Spinnors.....	14 9	15 9	17 —	14 —	18 —	18 —	527	619	29 2	265	18 6	18 6
Big piecers.....	7 6	7 6	8 6	6/-, 7/-	8 9	8 9	450	154	18 5	104	9 —	9 —
Little piecers.....	—	—	—	—	—	—	433	111	11 —	198	—	—
Piecers average.....	—	—	—	—	—	—	883	265	15 4	456	—	—
Throstle overlookers.....	17 9	17 6	18 6	16/-, 17/-	20 —	19 6	166	266	19 2	—	19 3	20 —
Throstle spinners.....	12 3	12 6	12 6	16/-, 20/-	13 6	14 6	935	1,995	15 6	2,435	14 3	14 6
Warpers.....	17 3	18 6	18 6	20/-, 22/-	24 —	24 6	228	436	22 6	548	23 3	24 3
Twisters-in.....	—	—	—	—	—	—	134	179	24 10	256	—	—
Drawers-in.....	—	—	—	40 —	—	—	111	30 2	241	30 11	—	—
Weaving overlookers.....	—	—	—	10/-, 11/-	—	—	366	44 8	498	601	—	—
Weavers, 2 looms.....	—	—	—	—	—	—	1,933	12 9	16 6	2,021	—	—
" 3 ".....	—	—	—	—	—	—	2,554	18 10	18 8	4,521	—	—
" 4 ".....	—	—	—	—	—	—	3,522	23 6	24 11	10,464	—	—
Weavers' average.....	20 9	21 3	21 —	23 —	23 —	23 6	8,009	13,719	22 1	17,081	23 3	23 3
Average per loom.....	6 6	6 7 3	6 7 1	5 9	7 1 8	7 4 4	—	—	6 7 7	6 6 2	7 3	7 3 7
Looms per weaver.....	3 2	3 2	3 2	40 —	3 2	3 2	—	—	3 3	3 3	3 2	3 2
Sizers.....	—	—	—	—	—	—	57	151	47 3	181	—	—
Labourers.....	13 9	13 3	15 —	16 3	17 —	17 —	133	202	20 6	227	16 3	16 3
Throstle jobbers.....	24 —	24 —	23 3	22 3	23 3	23 3	—	—	—	—	22 6	23 —
Sheeting weavers.....	—	—	—	—	—	—	—	—	—	—	—	—
Average per head in Carding.....	14 6	15 6	17 3	18 6	18 3	18 3	181	—	—	—	19 —	18 9
Department	—	—	—	—	—	—	—	—	—	—	—	—
Average of all.....	—	—	—	—	—	—	16,385	22,463	21 0	28,048	—	—

Notes to Table 22.

The figures for Preston in 1836 are from Ward's *Workmen and wages at home and abroad*.

In 1842, in the column marked *, the figures Marked (a) are for Acerington, (b) are for Chorley, (c) are for Darwen, and (d) are for Blackburn. With regard to the figures for Blackburn in 1855-61, (3A), it was stated in the Returns of Wages that these rates of wages remained unchanged during 1855-61, except "that a reduction of 5 per cent. was made in the wages of spinners and card room hands, and of 1s. per week in the wages of grinders in September, 1861."

The figures in column B are from S. Smiles' *Workmen's earnings, strikes and savings*, 1862; and in column 12B are quoted in Ellison's *Handbook to the cotton trade*, from Mr. Robertson's *A few months in America*, p. 216. Those in column C are from the "average" book mentioned above.

The amalgamation of the returns for Blackburn and Darwen in 1886 and Blackburn and Acerington in 1906 is made necessary by a change of district classification by the Board of Trade in the 1906 census. In the first year the districts were Blackburn and Darwen, Acerington and Clitheroe, and in the second, Blackburn district, including Darwen and Clitheroe and Acerington district. Comparisons between 1886 and 1906 can only be made, therefore, by amalgamation of these districts.

From two other mills in this district there have been obtained records of weavers' earnings for a considerable period. The number of looms per weaver is not known accurately, but as an indication of the probable course of earnings, the number at one mill where the details were ascertainable have been presumed to apply in these cases also. The general question of the number of looms per weaver will be discussed later. The details for these two mills are given in Table 23.

TABLE 23.—*Estimated earnings of weavers in two mills in the north and north-east Lancashire district.*

	1871.	1874.	1877.	1880.	1883.	1886.	1891.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Average per loom. Mill I	76.1	76.8	78.1	68.3	77.6	78.7	81.4
" " " II	—	69.8	75.8	67.0	76.4	79.0	80.5
Estimated looms per weaver	2.97	3.07	3.17	3.2	3.2	3.2	3.2
Estimated average per weaver. Mill I	19/-	19/10	20/10	18/3	20/8	21/-	21/8
Estimated average per weaver. Mill II	—	18/-	20/3	17/10	20/4	21/1	21/6

	1894.	1897.	1900.	1905.	1906.	1907.	1908.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Average per loom. Mill I	78.6	78.7	79.0	88.7	86.8	89.2	90.1
" " " II	78.2	79.8	79.0	87.9	91.1	90.2	88.9
Estimated looms per weaver	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Estimated average per weaver. Mill I	21/-	21/-	21/1	23/8	23/8	23/9	24/-
Estimated average per weaver. Mill II	20/10	21/3	21/1	23/5	24/4	24/-	23/8

I have been unable to trace the changes in wages under the Blackburn spinning list of 1853, but as it is still in use it will be

useful to note that, adopted in 1853, a reduction of 5 per cent. took place in 1861; advances, making prices 10 per cent. above 1853, took place by 1867, when the list was revised. The period between this date and June 20th, 1878, is blank, but at that date prices were at standard. In April, 1879, a 5 per cent. reduction left prices at 5 per cent. under 1853. This reduction was returned in 1880. Another 5 per cent. advance took place in 1881, and August, 1888, making prices 10 per cent. above standard. Since 1888 they have followed the Oldham list changes, and in May, 1907, were 25 per cent. above 1853.

Sequence of wages at Clitheroe.

The wage census incorporates the returns for Clitheroe with Blackburn in 1906, and presumably with Blackburn also in 1886. We have, however, some very valuable information relating a very large cotton spinning and weaving concern at Low Moor, Clitheroe, covering the period 1833 to 1909. The figures are taken from "The reply of the Free Trade League to the Report of the Tariff Commission on the Cotton Industry," by Professor S. J. Chapman, and the firm has kindly supplied me with the figures for 1909. Table 24 shows the particulars as given by Professor Chapman.

This exhausts such information as lends itself to tabulation, but we have still several items of considerable value, mainly relating to two great strikes which have taken place. The first of these was the Preston strike of 1836. This strike, according to the *Quarterly Review*, 1859, was by the spinners for an advance from 22s. 6d. per week to the Bolton rate of 26s. 6d. The strike lasted for thirteen weeks. "The masters carried the day and the men had to ask for work at prices much lower than those for which they struck," says one account,⁷ but the *Quarterly Review* says that the masters offered three-fourths of the advance asked for, and Banks⁸ says, that a 10 per cent. advance was gained, but soon withdrawn. The Factory Inspector's Report for 1842⁹ gives the following account of spinners' wages in Preston, the wages being for spinners on small mules, viz., of 416 spindles:—

1841 19s. 3d. | 1837 21s. 6d. after strike | 1804 35s.

Apparently some advance resulted from this strike, as the Report of the Committee on Trade Societies Strikes of the Social Science Association says, that "the spinners were compelled to succumb and to accept the terms which they had previously rejected." This report also states, that "among the results of this contest has been included the adoption of self-acting mules, which enabled the employers to dispense with a great many spinners."¹⁰ This may have been so, but there were many hand-mules in operation in 1853, when the next great strike took place. Ward quotes the following estimate of the numbers involved in this strike and their earnings:—

660 spinners at 22s. 6d.	6,520 card room hands, weavers,
1,320 piecers at 5s. 6d.	overlookers, engineers, &c., at 9s.

⁷ Ward, *Workmen and wages*, p. 30.

⁸ Banks, *Cotton trade in Preston for the last sixty-seven years*.

⁹ xxii of 1842.

¹⁰ P. 209.

TABLE 24.—Average* weekly wages paid to each class of operatives at Low Moor, Clitheroe, with production of yarn.

Year.	Card room workers.			Spinners.			Weekly output of yarn per head of spinners and card room hands.		Winding and warping.		Weaving.		Estimated average per weaver.†		
	Wages.		Persons.	Mule.		Persons.	Ring.		Wages.	Persons.	Looms per head.	Average per loom.			
	s.	d.	s.	d.	s.	d.	lbs.	s.	d.	s.	d.				
1833.....	6	8½	161	8	5	238	—	—	6	2	50	4	1½	8	3
'40*.....	5	10½	126	8	2	236	—	—	6	9½	56	3	11½	8	4
'50.....	5	11	152	7	1¼	165	—	—	6	3½	67	3	10¼	9	2
'60.....	10	11	84	12	10	116	—	—	8	9	78	4	6½	11	0
'70.....	13	4	102	19	—	94	—	—	11	8	80	5	7½	15	9
'74.....	13	9	105	18	6	106	—	—	12	3	85	5	7½	17	—
'77.....	14	4	104	18	11	104	—	—	11	2	91	3	8	17	3
'80.....	13	9½	104	17	9	95	10	6	11	2	91	4	11	15	—
'83.....	13	7	104	19	4	83	12	10½	13	10½	72	4	11¼	15	2
'86.....	13	6	105	18	1½	83	12	4	13	4	72	4	10	14	4
'91.....	16	11½	89	21	1	85	12	11¼	12	11½	80	3	1½	16	7
1902.....	17	—¼	90	21	7	76	15	3	12	7½	84	3	5	18	5
'05§.....	18	6¼	93	22	6½	68	15	7	15	1	78	3	5	21	10½
'09||.....	20	2	93	25	5	60	17	6¼	16	6¼	77	6	3	23	7

* Six weeks were averaged in 1833; 26 in 1840, 1850 and 1860; and the whole year in the succeeding years, except 1905, for which the week ending 9th August was taken, and 1909, for which the week ending 4th August was taken.

† This column has been added.

‡ Self-actor mules introduced.

§ Week ending 9th August.

|| Week ending 4th August.

If this is correct, it indicates an average of 9s. 6d. per operative per week.

The Factory Inspector's Report of 1842, above quoted, states that piecers' wages, at 6s. 6d., had been fairly stationary, but that the spinners had suffered reductions of 10 per cent. in 1840, and 10 per cent. in 1841, and that weavers had also suffered a reduction of 10 per cent. in 1840. Banks¹¹ says, that in 1841-2 three reductions took place. These remarks relate to Preston, but the reductions of 1841-2 were pretty general throughout Lancashire.

Another great strike took place at Preston in 1853. In 1847 a general reduction of 10 per cent. had been made, and in 1853 Stockport and Blackburn obtained its return. At Preston, however, the spinners struck for it, but without success. During the progress of this strike, the masters issued a statement of great interest. From 1836 to 1853, they stated, the hours of labour had been reduced from 69 to 60, but wages had advanced by 20 per cent. A 10 per cent. reduction of wages had been made in 1847, but allowing for the reduction of hours, the cardroom wages had advanced by 22 per cent., the spinners by 16 per cent., and the weavers by 11½ per cent., making an advance of 14 per cent. in all. This, of course, meant that wages for the 60 hours in 1853 were practically equal to those of 1847 for 69 hours, before the 10 per cent. reduction.

During this strike a large number of hand-mules were converted into self-acting mules.

From Eccles Shorrock's *History of the Formation of the Blackburn Association*, 1880, we learn that from 1850 to 1860 there was a very great extension of the trade in Blackburn, and that it led to a scarcity of workpeople. This is confirmed in the statement of Smiles,¹² that during the last few years (preceding 1861) wages in the cardroom at Darwen had advanced by 100 per cent. Edwin Chadwick, in his address on "Economy and Trade" to the Social Science Association, 1864, said that in the beginning of the century operatives in the cotton trade averaged 4s. 6d. per head, and that in Blackburn, in 1864, 25,865 operatives thrown out of work through the cotton famine had previously earned 11s. 5d. per head. Generally, he stated (meaning in the industry generally), the average was from 10s. 6d. to 11s. Power-loom weavers he put at 16s. to 17s., and the averages of men at 18s. 6d., women 10s., boys 7s., and girls 5s.

In 1872, the North and North-East Lancashire Employers' Association was formed.

In 1870-71, after the depression of 1868-69, when reductions were almost general, there took place a series of movements for advances in which the strippers and grinders were largely concerned. The requests for advances sometimes contained definite statements as to the wage then paid, and in the *Beehive* of 2nd July, 1870, we learn that the Preston strippers and grinders were only receiving 15s. or 16s., whereas in other districts they received 20s. to 22s. 6d.

¹¹ Banks, *Cotton trade in Preston for the last sixty-seven years*.

¹² *Workmen's Earnings, Strikes and Savings*, 1862.

This is corroborative of the 15s. for these operatives in 1870 stated for Preston in Table 22 from Authority 20. An advance of 10 per cent. is said to have been granted as the result of this movement. In 1871 the Blackburn card-room males asked for an advance from 18s. to 20s., with the result that the masters agreed to advance some by 1s. and others by 2s.¹³

In 1878 practically the whole of Lancashire was involved in an unsuccessful strike by the weavers against a 10 per cent. reduction.

The Report of the Labour Department on Strikes and Lockouts of 1892 gives a table of weavers' earnings at the end of 1892 as stated by trade union branches. From this we learn that at Accrington the average was 5s. per loom, at Chorley, 18s., at Clitheroe, 5s. per loom, and that the Blackburn beamers and twisters averaged 20s. per week.

In replies to schedules of questions issued by the Labour Commission, 1891, we learn that the Blackburn weavers earned 16s. to 24s. per week, and that the Preston spinners averaged 31s. per week. Two employers at Blackburn stated the wages paid by them, one in too wide ranges to be of any value, but the other, who employed 600 males and 700 females, of whom 300 were young persons and 30 labourers, stated that they earned 950*l.* weekly, equal to an average of 14s. 7*d.* weekly. This was rather low for Blackburn at that date.

Growth of number of looms per weaver.

In the early days of power-loom weaving we hear almost immediately of four-loom weavers, and almost invariably of two-loom weavers. Contemporary writers, strange to say, never mention the one-loom weaver, yet in 1886 we find them surviving in Scotland, and I have met with repeated evidence that they were known in Lancashire in the "fifties" or later. In the table relating to Low Moor, Clitheroe (Table 24), it is stated that the weavers averaged 2 looms each in 1833, and increased from 2 to 3 by 1874, from 3 to 3½ by 1891, and to 3½ by 1902. In the Wage Census we get :—

	1886.			1906.		
	Weavers.	Looms.	Average.	Weavers.	Looms.	Average.
Preston	3,534	10,944	3.09	8,009	25,628	3.2
Blackburn	8,007	27,931	3.49	13,719	47,775	3.48
Darwen	3,304	11,270	3.41	—	—	—
Accrington	—	—	—	3,362	11,138	3.31
Totals	14,845	50,145	3.38	25,090	84,541	3.37

Practically no change has taken place, therefore, for the past twenty years in the average number of looms per weaver. In the absence of an extension of the system of six-loom weaving, which is

¹³ *Beehive*, 15th July, 1871.

at present confined to Burnley and district (men and women), Rochdale (men), Bacup (men), and Blackburn (men), and is not very prevalent outside the Burnley district, practically no further increase in the average number of looms per weaver is to be anticipated. Previous to 1886, and more markedly previous to about 1874, however, the case was different, and the average appears to have been generally on the increase. If we assume that in 1833 the average was 2 per weaver, we are not entitled to further assume that the increase was gradual and uniform, except, perhaps, until the middle "fifties," as there were rapid expansions of the trade in 1859-61 and 1864-67, when the supply of new weavers did not equal the demands for the new looms. The question will come up for more detailed discussion later, when the general progress of wages is considered, but the average assumed for the weavers in Record C, Table 22, is based on the assumption that no increase took place after 1878.

Considerable difficulty arises when we attempt to allow for the weavers' "tenter" or assistant. Formerly, three-loom weavers generally, and four-loom weavers invariably, had assistants—lads or girls. To-day many four-loom weavers do not have assistants, and three-loom weavers have them but rarely. In the wage census of 1886 the wages are net after assistants are paid, but where we have only the average per loom we know that such assistants have to be paid out of the gross earnings. In the 1886 census we have the details as to weavers' assistants; in 1906 they are not given separately, but are classed with "other lads and boys" and "other girls."

In 1886 the details as to tenters were:—

	Preston.	Blackburn.	Darwen.
Weavers	3,534	8,007	3,304
Assistants—			
Girls, full time	328 at 5/7	174 at 5 4	44 at 5/3
„ half „	623 „ 2/9	1,074 „ 2/8	457 „ 2/7
Boys, full „	—	111 „ 5/3	24 „ 5/4
„ half „	39 at 2/4	749 „ 2/8	228 „ 2/8
Average cost of tenting per } weaver..... }	3 <i>d.</i>	9½ <i>d.</i>	8 <i>d.</i>

The averages per weaver given in Table 22 in columns under Authority 17 and Authority C, require to have some allowance made for tenters, and the amount of this allowance is unknown, but probably does not exceed 3*d.* or 4*d.* per week.

One informant in the Preston district states that tenters from 1865 to about 1870 had 4*s.* 3*d.* and 4*s.* 6*d.* per week, and that between that time and the middle "seventies" they advanced to about 5*s.* There has been a gradual change since, some, but not general, reductions were made in 1878-79, when weavers' prices fell, and they have since advanced until to-day they get 6*s.* 2*d.* and 6*s.* 3*d.*, boys and girls being paid alike. This practically amounts to their having received the proceeds of one-loom's work when employed as full-timers, and half that amount when half-timers.

A study of the tabulations from the wage census, both of 1886 and 1906, reveals two distinct differences between Preston and the Blackburn districts in the very considerable variations in spinners' wages, and in the employment of six-loom weavers at Blackburn, both in 1886 and in 1906, but not at Preston or Accrington. The wages of spinners were lower at Blackburn by some shillings per week than at either of the other two districts. The reason for this is, that here a system of "joiner-minding" is in general vogue. It is known also in other districts, but it is not very largely prevalent. Generally, there are one spinner (or "minder"), one big piecer, and one little piecer, to each pair of mules. On the long mules of Oldham and Ashton there may frequently be more than two piecers to each minder. In the North and North-East Lancashire district the mules are shorter, and many are worked with one minder and one big piecer, or even, in a few cases, with one little piecer. In Blackburn, however, there are only 265 piecers to 634 minders, and in the Accrington district 191 piecers to 265 minders. This is brought about by two adults jointly minding one pair of mules, with or without the assistance of a little piecer. Instead, therefore, of a high average wage for the minder and of a low average for an equal number of big piecers, we get a mid-way wage for more spinners, and the big piecer is largely eliminated. In Preston the earnings in a number of cases would be: spinners 39s. 6d., big piecer 17s. 6d., little piecer, 9s.; total for three persons, 66s.; average per head, 22s. At Blackburn, on mules of similar size, the earnings would be: two joiner-minders at 29s. each, and one little piecer at 11s.; total for three persons, 69s.; average per head, 23s. Where the minders did not "join" the wage would be, roughly, minder 39s., big piecer 19s., little piecer, 11s. At Accrington both systems are in vogue, but the system of "joining" not being so prevalent, the average wage of the "minders" is higher than at Blackburn. The wages of piecers, however, are very similar—big piecers, men, getting 18s. 10d. in each case; big piecers, lads, getting 17s. 3d. at Blackburn and 17s. 1d. at Accrington, and little piecers 11s. at Blackburn and 10s. 6d. at Accrington.

The sequence of wages from 1833 to 1905, given for Clitheroe in Table 24, is so nearly complete that it is unfortunate that we do not know how many looms or weavers were employed at various years, nor how many loomers, dressers and other less numerous operatives and their wages. It is not certain, or even probable, that the number of weavers has varied in any direct proportion to the number either of carders, spinners or warpers, while their tenters will probably have decreased relatively throughout. I have applied to the firm for some further information, but have unfortunately failed to get it. Some form of estimate must be made. As a first step the average wage per head of all employed in the carding, spinning and winding and warping departments has varied as follows:—

1833.	1840.	1850.	1860.	1870.	1874.	1877.	1880.	1883.	1886.	1891.	1902.	1905.	1909.
<i>d.</i> 90·6	<i>d.</i> 88	<i>d.</i> 78	<i>d.</i> 133	<i>d.</i> 177	<i>d.</i> 180	<i>d.</i> 180	<i>d.</i> 170	<i>d.</i> 177	<i>d.</i> 178	<i>d.</i> 201	<i>d.</i> 200	<i>d.</i> 215	<i>d.</i> 236

In 1833, it does not matter much what reasonable number of weavers we assume. If we assume that weavers number one-third of the whole establishment, we get 7*s.* 9*d.* as our average wage, if that for each winder and warper there were 14 looms, that is, at 2 looms per weaver, 7 weavers, we get 7*s.* 11*d.* as our average wage. This difference is insignificant. In 1905, however, we get an average of 19*s.* 3*d.* if we assume the weavers to have been one-third of the whole mill, and 19*s.* 11*d.* if we assume them to have been related to winders and warpers in the proportion of 14 looms or 4 weavers per weaver and winder. In 1883 and 1905 these averages may fairly be regarded as the upper and lower limits. If the discrepancy was equal in proportionate amount in each year, it would not matter which we took, but the margin is 2 per cent. in 1833 and 3½ per cent. in 1905, a trifling difference only, but still leaving us in doubt. Perhaps, as the percentage advance is greater at Clitheroe than at any other centre, we should take the result which understates the advance rather than overstates it, and on the assumption, therefore, that weavers have formed one-third of the whole number employed at Clitheroe throughout, the average wage per head of all employed has been—

1833.	1840.	1850.	1860.	1870.	1874.	1877.	1880.	1883.	1886.	1891.	1902.	1905.	1909.
7/9	7/8	7/5	11/1	15/1	15/8	15/9	14/5	14/11	14/8	16/8	18/1	19/3	21/-

In 1906 the average wage at September, for those working full time, was 18*s.* 6*d.* at Preston, 21*s.* at Blackburn, and 19*s.* 9*d.* at Accrington. At the same date the averages for all workers, including those who worked more or less than full time were, Preston 18*s.* 5*d.*, Blackburn 20*s.* 10*d.*, and Accrington 19*s.* 5*d.* Taking the returns of monthly numbers paid wages and the total amounts paid on the last pay day of each month the averages were, Preston 18*s.* 5*d.*, Blackburn 21*s.*, and Accrington 19*s.* 9*d.* With these figures we may compare the averages compiled from the monthly returns in the *Labour Gazette*, thus :—

	Preston.		Blackburn, Accrington, and Darwen.			Preston.		Blackburn, Accrington, and Darwen.	
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>		<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>
1905....	17	6	19	9	1908	16	7	18	11
'06....	18	1	20	—	'09 (Jan. to Aug.) }	17	9	19	9
'07....	17	9	20	2½					

In view of the fact that we have so much unidentifiable material previous to 1886, it is fortunate that wages in many occupations in

that year are roughly about equal in each of the two chief centres, Preston and Blackburn, and also that in those years when we definitely know the source of our figures the course of wages in each district has been very much alike. The following numbers show this:—

	<i>Circa,</i> 1840-42.	1860.	1870-71.	1882-83.	1886.	1906.
Blackburn	55	77	94	100	100	124 $\frac{2}{3}$
Preston	55	71	91	100	100	121 $\frac{1}{3}$

As the general changes in wages have been carried out by the same Associations at each place since 1872, and the chief occupation (weaving) has been carried on under the same standard price list since 1853, we are probably safe in interpolating between these dates on the assumption that both districts have varied together.

Combining the information in these tables we get the following as the index numbers showing the changes in average wages for cotton factory operatives at Preston, Blackburn and Clitheroe:—1833 to 1906. (1886 = 100):—

TABLE 25.

Year.	Preston.	Blackburn.	Clitheroe.	Year.	Preston.	Blackburn.	Clitheroe.
1833 ...	—	—	53	1874	97	98	107
		(1842)		'77	105	105	108
'40-41	55	55	52	'80	96	96	98
'45	56	56	—	'83	100	100	102
'50	54	56	51	'86	100	100	100
'55	56	60	—	'91	110	110	114
'60	71	77	76	'96	109	113	—
'64	71	73	—	1900	111	119	—
'66	85	87	—	'02	—	—	123
'70	—	—	103	'05	—	—	131
'71	91	94	—	'06	121	125	—

Burnley and district.

This district is the home of coloured goods, fast running looms, and a high average number of looms per weaver. The average wage per operative, 23s. 10d., is 2s. 10d. per week higher than in any other textile district in the kingdom, except the Nottingham and Derby lace districts. The average of all employed is exactly the average of the women, 23s. 10d., so that the high average does not depend on a large number of men. We have little information relating to the history of wages at Burnley, however, and cannot form any index numbers for earlier than 1886. The tabulation of such information as we have is given in Table 26. In 1892 the average wage per weaver at Colne was said to have been 22s. to 23s., and at Nelson 18s. per four-loom weaver. At Padiham, in that year, an employer reported to the Labour Commission that the average per head of his 630 employees was 18s., and Mr. David Holmes, on behalf of the operatives, estimated the average at 5s. per loom, and 22s. per weaver after paying assistants, while Mr. Rawlinson, the employers' secretary, estimated the average per loom

TABLE 26.—*Burnley and district. Average earnings of cotton operatives for an ordinary week's work, 1882-1906.*

Authority	1882.		1886.		1891-93.		1891.		1893.		1899.		1906.	
	—		1.		11.		57.		—		57.		2.	
	s.	d.	Number.	Wage.	Number.	Wage.	s.	d.	s.	d.	s.	d.	Number.	Wage.
Winders	12/6, 20/-	17/6, 22/6	559	s. 15 3 d. 21 7	16	s. 18 — d. —	18	—	—	—	18	6	1,241	s. 18 5 d. 25 10
Warpers	—	—	35	21 7	—	—	—	—	—	—	—	—	97	25 10
Twisters-in	—	—	113	21 10	—	—	24/-, 35/-	—	—	—	24/-, 35/-	—	322	33 7
Drawers-in	—	—	23	28 4	5	16/-, 35/-	25/-, 35/-	—	—	—	20/-, 35/-	—	148	33 7
Weavers, 2 looms	—	—	316	10 8	—	—	10 6	—	—	—	10 9	—	1,036	12 5
" 3	15/6, 18/-	—	417	15 7	—	—	15 9	—	—	—	16 2	—	1,429	19 —
" 4	20/-, 24/-	—	2,743	21 5	—	24	21 —	—	21	—	21 6	—	10,705	25 6
" 6	30/-, 36/-	—	557	25 8	—	26 6	—	—	—	—	—	—	1,505	33 6
Assistants	3 6*	—	754*, 148	3/-* 6/4	—	6 6	—	—	—	—	—	—	—	—
Average per loom	—	—	—	5 1	—	5 6	—	—	—	—	—	—	—	6 2-8
" weaver	—	—	4,033	20 7	180†	—	—	—	—	—	—	—	14,675	24 9
Weaving overlookers	28/-, 42/-	—	89	36 3	—	38	40 —	—	—	—	42 —	—	636	43 11
Dressers, sizers	30/-, 42/-	—	89	33 7	6	40 —	40 —	—	—	—	48 —	—	107	44 3
Beamers	17/6, 22/6	—	53	24 7	2	33 —	—	—	—	—	—	—	—	—
Cloth lookers	—	—	55	24 1	6	33 —	—	—	—	—	—	—	—	—
Labourers	—	—	12	19 8	4	18 —	—	—	—	—	—	—	120	21 10
Lads	—	—	—	—	4	10 —	—	—	—	—	—	—	—	—
Average of all	—	—	7,223	17 10	—	—	—	—	—	—	—	—	21,080	23 10

* Half-timers.

† With tenters.

at 5s. 3d., and per operative, after paying assistants, 21s. Shultze-Gaevernitz estimated the average per loom in 1891 at 5s., and the weekly wage 22s. to 27s.

The average per head of all employed in 1886 was 17s. 10d., in 1906, 23s. 10d. for those who worked only full time, and 23s. 8d. for those who worked more or less than full time. From the *Labour Gazette* we find that the averages per head have been: 1905, 22s. 2½d.; 1906, 23s.; 1907, 23s. 5d.; 1908, 19s. 5d.; 1909, 22s. (January to August). From the whole of our information we deduce the following as index numbers representing the course of average wages in the Burnley district, 1886-1909 (1886 = 100).

1886 100 | 1891 111 | 1899 118 | 1906 133

Rochdale, Bury, Bacup, Todmorden, &c.

We have to combine these districts because the census of 1886 and of 1906 are not comparable owing to Bury and Rochdale being given separately in 1886 and together in 1906, and to the inclusion of Todmorden with Bacup in 1886 and with Rochdale and Bury in 1906.

The effect in 1886 of this amalgamation is shown in the following table :—

	Men.		Lads and boys.				Women.		Girls.				All.	
			Full time.		Half-time.				Full time.		Half-time.			
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>		
Rochdale, &c.	23	5	11	4	3	1	13	11	9	8	3	1	14	8
Bury, &c.	24	2	10	5	2	6	15	10	8	9	2	5	12	11
Bacup, &c.	21	—	11	1	2	11	16	—	10	8	2	8	15	6
All above districts	22	4	10	11	2	11	15	4	9	8	2	8	14	6

The average of all employed is thus found to be 14s. 6d. in the combined districts, varying from 12s. 11d. at Bury to 15s. 6d. at Bacup.

In 1906 the averages are extraordinary close, thus :—

	Men.		Lads and boys.			Women.	Girls.				All.			
	Full time. Half-time					Full time. Half-time.								
	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>d.</i>		
Bacup	26	—	12	9	3	10	18	11	12	9	3	8	19	5
Rochdale.....	27	9	12	6	3	10	18	11	12	7	3	9	19	6
Combined	27	3	12	8	3	10	18	11	12	7	3	9	19	6

but the various occupations show greater divergences. Spinners at Rochdale average 41s. 1d. and at Bacup only 30s. 9d., a difference partly due to "joiner-minding," and more due, apparently, to much shorter mules, as these are practically the normal proportions of minders and piecers at Rochdale, but at Bury 190 spinners to 133

big and only 58 little piecers, or only one piecer per spinner instead of two. Women weavers again earn 20s. 4d. at Bacup and 18s. 8d. at Rochdale, while drawing-frame tenters earn only 18s. 1d. at Bacup against 21s. 9d. at Rochdale, slubbers 17s. 1d. against 21s. 2d., intermediates 17s. 11d. against 19s. 11d., and rovers 16s. 9d. against 19s. 2d. We learn that in 1833 at a mill in Bury the average of 557 persons was 9s. 1'69d. per head, and of the children under fourteen years 3s. 3'63d. per head. In 1841 we are told that the average of all in a mill at Bury was 9s. 6d. At Rochdale, in 1844, according to John Bright,¹⁴ the average at his mill was 10s. 1d. per head of all employed. At Bacup, the average wages of weavers was stated in the report on strikes and lockouts of 1892 as 18s. to 19s. per week; at Bury as 4s. 6d. to 5s. 3d. per loom; and at Heywood as 22s. per week.

TABLE 27.—*Bury, Bacup, Rochdale and district. Average earnings for an ordinary week's work for cotton operatives, 1833-1906.*

Date	1836.	1836.	1836.	1836.	1839.	1841.	1841.	1841.	1841.
District.....	Bury.	Bury.	Bury.	Bury.	Rochdale.	Bury.	Bury.	Bury.	Bury.
Authority.....	26a.	26b.	26c.	26d.	†	26a.	26b.	26c.	26d.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Openers and mixers	—	—	—	—	—	—	—	—	—
Scutchers, M.....	—	—	—	—	—	—	—	—	—
„ W.....	—	—	—	—	—	—	—	—	—
Strippers and grinders ..	10 6	—	15 —	—	—	10 —	—	12 —	—
Carding overlookers	—	—	—	—	—	—	—	—	—
Lap carriers.....	—	—	—	—	—	—	—	—	—
Drawing tenters	—	—	—	—	7 6	—	—	—	—
Slubbing tenters	—	—	—	—	8 —	—	—	—	—
Intermediate tenters	—	—	—	—	—	—	—	—	—
Roving tenters	—	—	—	—	8 —	—	—	—	—
All tenters	6'6, 8/-	6 6	7'6, 8/6	6/-, 7'6	—	6'6, 7'6	6 —	7'6, 8/-	6'6, 7/-
Back tenters	—	—	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—	—	—
Hand-mule spinners.....	27 —	15 —	27 —	25 —	—	25 —	18 —	24 —	15'6, 20/-
S.A. minders	—	—	—	—	—	—	—	—	—
Big piecers	9 —	—	8 6	8 6	—	8 —	—	8 —	8 —
Little piecers	6 6	5 —	6 6	5 6	—	5 —	4 6	6 —	5 —
All piecers	—	—	—	—	—	—	—	—	—
Scavengers	4 6	2 4*	—	2 4*	—	5 —	2 9*	—	2 4*
Throstle overlookers.....	—	—	—	—	—	—	—	—	—
„ spinners	—	—	—	—	8 —	—	—	—	—
„ doffers	—	—	—	—	5 6	—	—	—	—
Reelers	—	—	10'6, 11'6	9'6, 11'6	—	—	—	10'6, 11'6	9'6, 11'6
Winders	—	—	—	—	—	—	—	—	—
Warpers, W.	—	—	—	—	—	—	—	—	—
Ball warpers	—	—	—	—	—	—	—	—	—
Beamers	—	—	—	—	—	—	—	—	—
Twiners.....	—	—	—	—	—	—	—	—	—
Drawers-in	—	—	—	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—	—	—	—
Sizers, &c.	—	—	—	—	—	—	—	—	—
Weaving overlookers	—	—	—	—	—	—	—	—	—
Weavers, 2 looms	—	—	—	—	—	—	—	—	—
„ 3 „	—	—	—	—	—	—	—	—	—
„ 4 „	—	—	—	—	—	—	—	—	—
„ 6 „	—	—	—	—	—	—	—	—	—
Weavers' average	8 3	—	10'6, 15/-	9'6, 10/-	—	9 —	—	10'6, 15/-	9 —
Average per loom	—	—	—	—	—	—	—	—	—
Looms per weaver.....	—	—	—	—	—	—	—	—	—
Weavers' assistants	—	—	—	—	—	—	—	—	—
Reachers-in	—	—	—	—	—	—	—	—	—
Blacksmiths & mechanics	—	—	—	—	22 —	—	—	—	—
Labourers.....	—	—	—	—	—	—	—	—	—
Average of all.....	—	—	—	—	—	—	—	—	—

* Half-timers.

† Statement by John Bright.

¹⁴ Speech in the House of Commons, 15th March, 1844.

TABLE 27 *Contd.*—*Bury, Bacup, Rochdale and district, 1833-1906—Contd.*

Date	1871.	1871.	1881.	1886.		1886.		1886.	
District.....	Rochdale.	Bury.	Rochdale.	Rochdale.		Bacup.		Bury.	
Authority	9	9	†	1		1		1	
	s. d.	s. d.	s. d.	No.	Wage.	No.	Wage.	No.	Wage.
Openers and mixers.....	—	12 -	—	32	16 8	34	15 2	27	17 6
Schutchers, M.	—	18 -	—	72	17 11	67	17 9	57	18 1
„ W.	—	12 -	—	2	11 5	—	—	13	11 7
Strippers and grinders ..	16 -	18 -	—	133	18 9	98	17 3	105	18 8
Carding overlookers.....	35 -	20/-, 35/-	—	44	29 1	50	25 7	42	28 7
Lap carriers.....	—	10 -	—	7	15 10	6	15 2	12	15 10
Drawing tenters	—	13 -	15 -	153	13 11	131	13 6	112	13 11
Slubbing tenters	16 -	13 -	14 -	516	14 3	374	14 -	397	14 10
Intermediate tenters	—	—	—						
Roving tenters	14 -	13 -	14 -						
All tenters	—	—	—	669	14 2	505	13 11	509	14 7
Back tenters	—	7 -	—	11, 103	3/5,* 8/5	26	8 1	90	8 5
Spinning overlookers	30 -	32 -	—	12	34 9	17	29 5	17	35 8
Hand-mule spinners.....	—	—	—	—	—	—	—	—	—
S.A. minders	—	28 -	—	194	31 3	170	24 8	223	29 8
Big piecers	—	12 -	—	183	14 11	136	15 8	190	14 -
Little piecers	—	7 -	—	131	9 11	23	10 8	134	9 3
All piecers	—	—	—	314	12 10	159	15 -	324	12 -
Scavengers	—	5 6	—	15, 8	4/2*, 8/11	12, 10	2/11*, 6/4	8, 5	2/11*, 6/-
Throstle overlookers	—	26 -	—	50	22 8	34	23 9	24	23 10
„ spinners	11 6	12 -	13 -	443	12 1	312	11 3	211	12 8
„ doffers	9 -	6 6	9 6	108, 33	3/2*, 6/11	201, 223	2/7*, 7/7	27, 181	2/6*, 7/-
Reelers	—	—	—	196	12 -	—	—	54	12 3
Winders	—	12 -	—	461	12 1	396	13 10	355	12 9
Warpers, W.	—	—	—	55	16 -	16	16 10	72	17 11
Ball warpers	22 -	30 -	—	68	33 5	35	29 4	21	28 -
Beamers	—	12/-, 22/-	—	11	23 -	38	22 10	—	—
Twiners.....	—	28 -	—	—	—	—	—	—	—
Drawers-in	—	15/-, 24/-	—	20	24 8	42	23 -	20	23 10
Twisters-in	—	{ 10/-, 15/-, 24/- }	—	46	17 9	121	17 5	57	18 10
Sizers, &c.	—	26 -	—	14	31 -	35	32 7	29	33 7
Weaving overlookers	—	30 -	—	48	30 7	109	33 4	71	33 2
Weavers, 2 looms	—	13 -	—	140	9 9	275	9 7	395	9 8
„ 3 „	—	—	—	978	14 11	1,422	14 8	624	14 7
„ 4 „	—	—	—	440	19 4	2,164	19 5	1,152	18 11
„ 6 „	—	—	—	31	22 10	197	25 2	39	23 9
Weavers' average	—	—	—	1,589	15 10	4,058	17 4	2,210	16 2
Average per loom	—	—	—	—	4 10 ⁵	—	4 9 ⁶	—	4 8 ⁹
Looms per weaver.....	—	—	—	—	3 ²	—	3 ⁶	—	3 ⁴
Weavers' assistants	—	5 -	—	54*	2 10*	448,* 56	2/10*, 6/1	447,* 36	2,5*, 5/-
Reachers-in	—	5 -	—	8*	2 6*	35,* 12	2/7*, 6/4	36,* 12	2,7*, 6/-
Blacksmiths & mechanics	—	—	34 -	18	30 1	43	28 2	31	30 1
Labourers	—	18 -	—	14	18 10	20	18 4	12	19 5
Average of all.....	—	—	—	5,663	14 8	8,201	15 6	6,030	12 11

* Half-timers.

† Statement by John Bright.

TABLE 27 *Contd.*—*Bury, Bacup, Rochdale and district, 1833-1906—Contd.*

Date	1886.	1905.	1906.	1906.	1906.
District	Combined.	Rochdale.	Bacup.	Rochdale.	Combined.
Authority.....	—	17	2	2	—
	No. Wage. s. d.	s. d.	No. Wage. s. d.	No. Wage. s. d.	No. Wage. s. d.
Openers and mixers.....	93 16 4	—	30 19 6	92 21 2	122 20 9
Scutchers, M.....	186 17 7	—	23 21 4	127 26 —	150 25 3
" W.....	15 11 7	—	—	—	—
Strippers and grinders ..	336 18 3	—	37 22 9	207 28 5	244 27 7
Carding overlookers.....	136 27 8	—	36 34 5	101 38 —	137 37 1
Lap carriers.....	25 15 8	—	—	—	—
Drawing tenters	396 13 9	23 —	110 18 1	297 20 8	407 20 —
Stubbing tenters	—	22 6, 23/6	96 17 1	245 21 8	341 20 5
Intermediate tenters ..	1,287 14 4	20/-, 22/-	56 17 11	298 19 11	354 19 7
Roving tenters	—	19 9	231 16 9	760 19 2	991 18 7
All tenters	1,683 14 3	—	493 17 3	1,647 19 10†	2,140 19 3†
Back tenters	11* 3 5*	8/9, 10/6, 11 —	—	—	—
Spinning overlookers	219 8 5	—	—	—	—
Hand-mule spinners.....	46 33 2	—	35 32 4	81 37 9	116 36 1
S.A. minders	587 28 9	—	191 30 9	676 40 11	867 38 8
Big piecers	509 14 9	—	133 19 7	696 19 7	829 19 7
Little piecers	288 9 8	—	58 12 10	639 12 11	697 12 11
All piecers	797 12 11	—	191 17 7	1,335 16 5	1,526 16 7
Scavengers	35*, 23 3 5*, 7/2	—	—	—	—
Throstle overlookers.....	108 23 3	—	—	—	—
" spinners	966 11 11	—	329 14 4	1,054 16 3	1,383 15 10
" doffers	336*, 447 2 9*, 7/4	—	—	—	—
Reelers	250 12 1	—	—	271 15 10	—
Winders	1,212 12 10	—	474 16 3	1,679 15 4	2,153 15 6
Warpers, W.	123 17 3	—	52 23 6	246 21 6	298 21 10
Ball warpers	124 31 4	—	31 36 1	116 44 2	147 42 6
Beamers	49 22 11	—	—	—	—
Twiners.....	—	—	—	—	—
Drawers-in	82 23 7	—	53 28 8	87 30 1	140 29 7
Twisters-in	224 17 10	—	70 22 10	176 21 10	246 24 3
Sizers, &c.	78 32 8	—	29 42 7	54 38 7	83 40 —
Weaving overlookers	228 32 8	—	150 41 4	406 39 —	556 39 8
Weavers, 2 looms	810 9 8	—	654 15 2	974 12 11	1,628 13 10
" 3	3,024 14 8	—	1,630 17 2	4,394 17 1	6,024 17 1
" 4	3,756 19 3	—	2,264 23 6	4,832 22 9	7,096 23 —
" 6	267 24 8	—	160 30 2	157 30 11	317 30 6
Weaver's average	7,857 16 7	—	4,708 20 5	10,357 19 6†	15,065 19 10†
Average per loom	— 4 9 6	—	— 5 11	— 5 8 5	— 5 9 3
Looms per weaver	— 3 5	—	— 3 4	— 3 4	— 3 4
Weavers' assistants	895*, 92 2/8*, 5/8	—	—	—	—
Reachers-in	79*, 24 2/7*, 6 2	—	—	—	—
Blacksmiths & mechanics	92 29 2	—	29 32 7	69 33 1	98 32 11
Labourers	46 18 9	—	52 20 7	194 20 4	216 20 4
Average of all.....	19,894 14 6	—	8,464 19 5	23,927 19 6	32,391 19 6

* Half-timers.

† Including 47 frame tents unclassified at 16s. 8d.

‡ Excluding 44 men fustian weavers on 4 looms at 19s. 4*d.*, and 104 women fustian weavers on 4 looms at 18s. 8*d.*. These are included in the average of all.

In 1906 the wage census shows the average of all employed, when working full time, to have been 19s. 6d. at Rochdale, and 19s. 5d. at Bacup, compared with 14s. 8d. at Rochdale, 15s. 6d. at Bacup, 12s. 11d. at Bury and 14s. 6d. over the whole district in 1886. For all employed, including those who worked more or less than full time, the average wages were in the last week in September, 1906, 19s. 4d. at Rochdale, 19s. 5d. at Bacup, and 19s. 4d. over the two districts combined. Taking the average number employed and the average amount of wages paid on twelve paydays during 1906, the

averages are 19s. at Rochdale, 19s. 2d. at Bacup, and 19s. 1d. over the whole district. The similar averages from the monthly returns in the *Labour Gazette* have been :—

	s.	d.		s.	d.		s.	d.
1905	18	5	1907	18	2	1909	18	4
'06	19	—	'08	17	11	(to August)		

We cannot procure reliable index numbers from this material for any except isolated years. The following are the best we can do, and the gaps between the years stated are very long :—

TABLE 28.—*Index numbers, showing the percentage changes in wages in the Rochdale, &c., district.*

1833	63	1844	69	1886	100
'36	66	'71	88	1906	134
'41	63				

(To be continued.)

III.—*Prices of Commodities in 1909.* By A. SAUERBECK.

THE following table shows the course of prices of forty-five commodities during the last twenty years as compared with the standard period of eleven years, 1867-77, which in the aggregate is equivalent to the average of the twenty-five years 1853-77 (see the *Society's Journal*, 1886, pp. 592 and 648, and 1893, pp. 220 and 247) :—

Summary of Index Numbers. Groups of Articles, 1867-77 = 100.

	Vegetable Food (Corn, &c.).	Animal Food (Meat, &c.).	Sugar, Coffee, and Tea.	Total Food.	Minerals.	Textiles.	Sundry Materials.	Total Materials.	Grand Total.	Silver.*	Wheat Harvest.†	Average Price of Consols.‡	Average Bank of England Rate.‡
1890	65	82	70	73	80	66	69	71	72	78.4	106	96½	4 ⁵ / ₁₀
'91	75	81	71	77	76	59	69	68	72	74.1	108	95¾	3 ³ / ₁₀
'92	65	84	69	73	71	57	67	65	68	65.4	91	96¾	2 ⁵ / ₁₀
'93	59	85	75	72	68	59	68	65	68	58.6	90	98½	3 ¹ / ₁₀
'94	55	80	65	66	64	53	64	60	63	47.6	106	101	2 ¹ / ₁₀
1895	54	78	62	64	62	52	65	60	62	49.1	91	106¼	2
'96	53	73	59	62	63	54	63	60	61	50.5	112	111	2 ⁵ / ₁₀
'97	60	79	52	65	66	51	62	59	62	45.3	97	112¼	2 ⁶ / ₁₀
'98	57	77	51	68	70	51	63	61	64	44.3	116	111	3¼
'99	60	79	53	65	92	58	65	70	68	45.1	109	107	3¼
1900	62	85	54	69	108	66	71	80	75	46.4	95	99½	4
'01	62	85	46	67	89	60	71	72	70	44.7	103	94	3¼
'02	63	87	41	67	82	61	71	71	69	39.6	110	94½	3 ³ / ₁₀
'03	62	84	44	66	82	66	69	72	69	40.7	101	90¾	3¼
'04	63	83	50	68	81	71	67	72	70	43.4	90	88¼	3 ³ / ₁₀
1905	63	87	52	69	87	72	68	75	72	45.7	110	89¾	3
'06	62	89	46	69	101	80	74	83	77	50.7	112	88¼	4¼
'07	69	88	48	72	107	77	78	86	80	49.6	113	84	4 ⁹ / ₁₀
'08	70	89	48	72	89	62	73	74	73	40.1	108	86	3
'09	71	89	50	73	86	64	76	75	74	38.9	113	83¾	3 ¹ / ₁₀
Average													
1900-09....	65	87	48	69	91	68	72	76	73	44.0	106	90	3 ⁶ / ₁₀
1890-99....	61	80	63	68	71	56	66	64	66	55.8	103	103½	3
'78-87....	79	95	76	84	73	71	81	76	79	82.1	97	99½	3 ² / ₁₀

* Silver 60.84*d.* per oz. = 100.

† Wheat harvest in the United Kingdom to 1895, 29 bushels = 100, from 1896, 30 bushels = 100.

‡ Consols and bank rate actual figures, not index numbers; consols 2¾ per cent. from 1889 2½ per cent. from April, 1903.

The index number of all commodities was 74 last year, or one point higher than in 1908. It was 26 per cent. *below* the standard period 1867-77, but one point *above* the average of the last ten years, and 12 per cent. *above* the average of the lowest decade on record, 1890-99 (average index number 66).

Animal food was on the average unchanged last year as compared with the previous year, and minerals, especially coals, were lower, while all other groups were somewhat higher.

The monthly fluctuations were as follows :—

February, 1895....	60·0	December, 1907....	76·2	June, 1909....	75·1
July, '96....	59·2	„ „ '08....	72·3	July, „	75·2
„ 1900....	76·2	January, 1909....	72·0	August, „	74·9
December, 1901....	68·4	February, „	71·9	September, „	74·7
„ '05 ...	74·9	March, „	72·4	October, „	75·2
„ '06 ...	79·7	April, „	74·3	November, „	75·5
May, 1907....	82·4	May, „	75·4	December, „	76·3

The monthly index number rose till May, but was slightly easier in the summer months, being principally influenced by articles of food. It showed again a steady advance after September, making it at the end $5\frac{1}{2}$ per cent. higher than at the end of 1908.¹

Taking articles of food and materials separately, the index numbers compare thus (1867-77 = 100 in both cases) :—

	Average.			Feb., 1895.	July, 1896.	Feb., 1900.	July, 1900.	May, 1907.	Dec., 1908.	Dec., 1909.
	1878-87.	1890-99.	1900-1909.							
Food	84	68	69	63·8	60·0	65·8	71·2	73·5	70·1	72·0
Materials	76	64	76	57·0	58·6	81·9	79·8	88·9	74·0	79·4

Articles of food are nearly 3 per cent., materials 7 per cent. higher than a year ago, the latter largely influenced by the movements of cotton.

The position of the six separate groups of commodities at the end of the last three years in comparison with whole periods is illustrated by the following index numbers (1867-77 = 100 in each case) :—

	Average.			Dec., 1907.	Dec., 1908.	Dec., 1909.	Last Year, per Cent.
	1878-87.	1890-99.	1900-09.				
Vegetable food, } corn, &c.	79	61	65	73·4	68·0	68·5	rise 1
Animal food (meat } and butter)	95	80	87	87·9	85·6	87·0	„ 1½
Sugar, coffee, and tea	76	63	48	49·0	47·0	52·7	„ 12
Minerals	73	71	91	92·0	87·9	90·6	„ 3
Textiles.....	71	56	68	68·6	60·1	71·0	„ 18
Sundry materials.....	81	66	72	76·1	75·3	78·4	„ 4

Corn advanced till July, but had a lower market later on. Meat followed a similar course, while sugar, coffee, and tea advanced towards the end of the year. Sugar, owing to a smaller crop, rose from 10s. 1d. per cwt. for beet to 12s. 4d., and the coffee standard of Santos went from 26s. 6d. per cwt. to 37s., but closed at 33s. Iron showed on the average very little change, but copper fell from 63¾l. per ton to 55l., and rose again to 61¾l. Tin was firmer, and finished at 153l. per ton, against 132l. at the end of 1908. Lead

¹ In January, 1910, the index number was 77·1, and in February, 78·1.

was on a moderate level throughout the year, and realised about $13\frac{1}{2}l.$ per ton. Export coal was on the average cheaper; prices ruled higher from April to September, owing to labour questions, but were lower in October and November. Among textiles we had a very strong advance for cotton from $5d.$ per lb. to $8\frac{1}{2}d.$, against $9d.$ in 1904 and $2\frac{3}{4}d.$, the lowest, in 1895. Wool rose from 10 to 30 per cent., according to quality, the coarser descriptions to a greater extent than fine wool. Flax was also dearer, but jute was cheaper than in the year before. Hemp and silk were on the average unchanged. In the group of "sundry materials" we have a higher market for hides, leather, and linseed oil, but not much change for other articles.

*Quarterly Movements of Prices.**

Summary of Index Numbers, 1867-77 = 100.

Years.	Quar- ters.	Vege- table Food (Corn, &c.).	Animal Food (Meat, &c.).	Sugar, Coffee, and Tea.	Total Food.	Mine- rals.	Tex- tiles.	Sundry Mate- rials.	Total Mate- rials.	Grand Total.	Silver.†
1902....	IV	61.9	84.9	41.7	66.1	82.3	61.7	70.1	70.8	68.8	37.0
	I	61.6	86.9	42.6	67.0	85.7	63.7	70.2	72.4	70.0	36.6
'03	II	62.5	84.1	42.9	66.4	82.9	65.6	69.2	71.8	69.5	40.1
	III	64.0	85.0	43.2	67.3	81.0	65.9	68.7	71.2	69.5	43.6
	IV	61.7	81.7	45.1	65.6	80.3	67.9	69.9	72.1	69.3	43.8
	I	63.7	79.9	45.3	65.8	82.0	74.0	69.5	74.2	70.7	42.8
'04	II	62.9	84.7	48.1	67.8	79.9	70.2	66.9	71.4	69.9	42.0
	III	63.5	85.8	50.1	68.9	79.5	70.5	66.8	71.3	70.3	43.7
	IV	63.4	83.4	55.3	69.1	84.7	68.4	67.6	72.5	71.0	45.2
	I	62.6	85.7	58.6	70.3	85.6	67.9	67.0	72.3	71.5	44.6
'05	II	63.1	88.4	53.0	70.3	83.9	69.7	68.5	73.0	71.9	43.8
	III	61.9	87.9	47.9	68.6	87.0	74.9	67.9	75.2	72.4	45.8
	IV	62.9	86.6	46.1	68.1	94.1	75.5	70.8	78.5	74.1	48.8
	I	62.1	89.6	45.3	68.7	96.7	76.5	72.1	80.1	75.3	49.7
'06	II	63.8	89.0	45.1	69.2	99.1	81.3	72.7	82.5	76.8	50.3
	III	61.3	89.3	46.5	68.5	101.4	80.1	73.3	83.0	76.9	50.7
	IV	61.7	87.9	47.0	68.1	110.5	80.4	76.6	86.9	78.9	53.0
	I	64.0	88.7	46.7	69.5	112.2	80.0	78.8	88.2	80.2	51.5
'07	II	69.7	88.7	48.0	72.1	112.6	79.8	80.0	88.7	81.7	50.6
	III	70.1	89.1	49.1	72.7	106.5	76.8	77.5	85.1	79.9	51.9
	IV	73.8	87.0	48.2	73.3	95.9	71.2	76.5	80.1	77.2	43.3
	I	71.7	88.9	49.1	73.3	92.0	64.9	73.8	76.0	74.9	42.0
'08	II	71.1	90.0	50.0	73.7	87.7	62.6	71.7	73.2	73.4	40.3
	III	68.2	90.3	47.2	71.9	88.4	61.7	71.7	73.1	72.6	39.3
	IV	67.8	85.1	47.0	69.8	88.5	61.0	74.3	74.0	72.2	37.7
	I	69.3	85.2	48.7	70.8	85.5	60.2	74.4	73.0	72.1	38.5
'09	II	76.1	91.1	49.6	76.0	84.9	62.8	75.5	74.1	74.9	39.6
	III	70.6	90.6	49.9	73.6	86.5	67.4	75.3	75.9	74.9	39.0
	IV	67.9	88.2	52.8	72.2	88.2	70.3	77.6	78.2	75.7	38.9

* The four quarterly figures of each year do not in all cases exactly (in the decimals) agree with the annual averages, as the latter are partly calculated from revised figures. See also the Society's *Journal*, 1893, p. 221; 1895, p. 144; 1901, p. 90; and 1909, p. 70.

† Silver 60.84d. per oz. = 100.

The quarterly numbers show the average of three monthly figures, and by thus eliminating minor fluctuations they give a more trustworthy comparison of the gradual changes of the various groups of commodities. We observe the great rise of vegetable food in the second quarter, and high prices for animal food in the second and third quarters, and the constant rise of textiles. Minerals and sundry materials are also higher in the second half of the year.

The following figures show in each case the average index numbers of all the forty-five commodities for ten years (see the dotted line in the diagram of the *Journal*, 1886, and also the *Journal*, 1893, p. 220); they give the best picture of the gradual movement of the *average* prices of *whole periods*, as the ordinary fluctuations are still further obliterated :—

1818-27 = 111	1887- 96 = 68	1894-1903 = 66
'28-37 = 93	'88- 97 = 67	'95- '04 = 67
'38-47 = 93	'89- 98 = 66	'96- '05 = 68
'48-57 = 89	'90- 99 = 66	'97- '06 = 70
'58-67 = 99	'91-1900 = 66	'98- '07 = 71
'68-77 = 100	'92- '01 = 66	'99- '08 = 72
'78-87 = 79	'93- '02 = 66	1900- '09 = 73

From the decade 1889-98 to the decade 1894-1903 the average of ten years had remained 66, the really lowest decade more closely calculated being 1890-99; since the period 1894-1903 we see a gradual advance, each decade being 1 point higher, until the last decade showed the figure of 73, being about 11 per cent. *above* the lowest period.

Silver had the lowest annual average on record, although in the course of 1902 it touched a lower price. The movements in the course of last year were within moderate compass. Stocks accumulated in the Indian Treasury until October, but are now very much reduced. The prices and index numbers were as follows (60·84*d.* per oz. being the parity of 1 gold to 15½ silver = 100):—

	Price.	Index Number.		Price.	Index Number.
	<i>d.</i>			<i>d.</i>	
Average 1890-95 ...	34	= 55·8	<i>Lowest</i> Nov., 1902	21½ ¹ / ₆	= 35·6
„ 1900-09	26¾	= 44·0	End Dec., 1904 ...	28¾	= 46·6
„ 1893	35½	= 58·6	„ Dec. '06 ...	32½ ⁵ / ₈	= 53·1
„ 1902	24½ ¹ / ₆	= 39·6	„ Dec. '07 ...	24¾ ⁵ / ₈	= 40·9
„ '08	24¾	= 40·1	„ Dec. '08 ...	23¾ ³ / ₈	= 38·1
„ '09	23½ ¹ / ₆	= 38·9	„ Dec. '09 ...	24¼ ¹ / ₄	= 39·9

Gold.—The production was estimated :—

£	
1881-85	21,000,000 (average).
'86-90	23,000,000 „
'91-95	33,000,000 „
'96-1900	53,000,000 „
1901-'05	66,000,000 „
'06	82,000,000
'07	84,000,000
'08	88,000,000 (rough estimate).
'09	92,000,000 „ „

The *Rate of Discount* in the three principal markets is shown in the following table :—

[Per cent. and two decimals.]

	London.		Paris.		Berlin.		Average of the Three Markets.	
	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.	Bank Rate.	Market Rate.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1895	2'00	0'80	2'10	1'59	3'14	2'02	2'41	1'47
1900	4'00	3'70	3'25	3'17	5'33	4'41	4'19	3'76
'04	3'30	2'65	3'00	2'19	4'22	3'14	3'51	2'66
'05	3'00	2'61	3'00	2'10	3'82	2'85	3'27	2'52
'06	4'25	3'98	3'00	2'72	5'15	4'04	4'13	3'58
'07	4'90	4'49	3'47	3'40	6'03	5'12	4'80	4'34
'08	3'00	2'23	3'04	2'25	4'76	3'52	3'60	2'67
'09	3'10	2'26	3'00	1'79	3'93	2'85	3'34	2'30

The average rates in 1895 were the lowest on record, those in 1907 the highest since 1873. The private rate for best bills was on the average $2\frac{5}{16}$ per cent., against $2\frac{5}{8}$ per cent. in 1908 and $4\frac{5}{16}$ per cent. in 1907.

It may not be without interest to compare the rates of discount with the index numbers of commodities and the gold production. In examining the history of prices, the last thirty-six years may be divided into three periods of exactly twelve years each. We know we had unusually high prices in 1872 and 1873, with extreme money rates, and the period 1874-85 showed gradually falling prices and lower discount rates, together with a moderate production of gold. In the following period, 1886-97, we kept more or less on a low level, while the production of gold was gradually rising from 22,000,000*l.* to 48,000,000*l.* This was the flat period in which money ruled about $\frac{1}{2}$ — $\frac{2}{3}$ per cent. cheaper on the average and investment stocks were at their best. The last period, 1898-1909, saw a recovery in prices, a great rise in the production of gold from 48,000,000*l.* to 92,000,000*l.*, and a rise in money rates of $\frac{5}{8}$ — $\frac{3}{4}$ per cent.

The following are the figures :—

Average.	Three markets.		Index number of commodities, 1867-77 = 100.	Gold production.
	Bank rate.	Market rate.		
	Per cent.	Per cent.		Min. £'s.
1874-85.....	3.55	2.86	87	21
'86-97	3.07	2.27	67	31
'98-1909....	3.70	3.05	72	71

Review of the year.—The past year must still be considered as a rather unsatisfactory one in most branches of European trade. There are a few exceptions, particularly the wool trade, but also the linen, leather, and indiarubber trades, which were well occupied at rising prices. The iron trade was hardly any better than in the previous year, shipbuilding was still unsatisfactory, and the shipping trade was in a very unfavourable condition. The cotton industry suffered enormously under the manipulated rise of prices in view of a considerable reduction in the American crop, and the coal miners were in fear of strikes during the greater part of the year. Some other unfavourable points were the state of politics in this country, and the weather. The best that can be said was the *tendency* of prices and trade. We had poor crops in 1908, and prices were still greatly affected in the first half of the year by dear corn, and also meat. They fell when it became evident that we should have to face an abundant crop, and trade generally showed signs of improvement in the second half of the year. Comparisons with its depressed predecessor became more and more favourable, and the turnover of the whole external trade of this country was over 1,094,000,000*l.* against 1,050,000,000*l.* in 1908 (bullion omitted). In America the prosperity continued, and reacted on certain European trades.

The prospects are now much more promising. We have favourable harvests, particularly in Russia, Canada, the United States, and Australia, and moderate money rates. The Far East is improving, and there are plenty of indications that we are gradually recovering from the effects of the crisis at the end of 1907. The gold production remains exceedingly large, and its effect on prices will probably be maintained. I have already referred to this fact in my remarks on the *rate of discount*. Of course, in view of the expansion of trade and the large production of commodities, such effect can only be a moderate one. The average index number of the ten years 1900-09 is 73 (against 72 from 1899-1908, and 71 from 1898-1907), and last year's average of 74 ought to be fairly safe, while the figure of about 76 at the end of the year may be reduced with moderate prices for corn and lower rates for cotton.

The arithmetical mean of the forty-five index numbers, which is 74 in 1909, 73 in 1908, and 80 in 1907, has been subjected to the usual test of using the same index numbers of the separate articles, but

calculating each article according to its importance in the United Kingdom on the average of the years 1904-06. In this case the average is 74·9, against 74·2 in 1908, and 77·4 in 1907. According to these figures, the fall in 1908, on account of the large articles, coal, wheat, and beef, was less important than in the index numbers, while the rise in 1909 is nearly the same.

The price movements of the external trade of this country—total imports into the United Kingdom and exports of British and Irish produce—were as follows, 1873 called 111 in accordance with my index number (see the *Society's Journal*, 1905, p. 146):—

	Total Imports into United Kingdom and Exports of British and Irish Produce.			Ratio of Values. 1873 = 111.	
	Declared Value.	Value at Prices of Preceding Year.*	Values at Prices in 1873.	British Trade.	My Arithmetical Index Numbers.
	Mln. £'s.	Mln. £'s.	Mln. £'s.		
1873	626·0	—	626	111·0	111
'89	675·3	664·5	1,005	74·6	72
'99	749·7	724·7	1,241	67·1	68
1900	815·1	739·1	1,224	73·9	75
'01	802·7	836·9	1,256	70·9	70
'02	812·4	831·9	1,302	69·3	69
'03	833·8	826·5	1,323	69·9	69
'04	852·2	847·0	1,345	70·3	70
'05	895·3	889·6	1,408	70·6	72
'06	983·7	940·9	1,480	73·8	77
'07	1,072·1	1,023·5	1,540	77·3	80
'08	970·4	1,010·1	1,451	74·2	73
'09	1,003·1	1,010·4	1,511	73·7	74

* According to the valuable calculations of the *Economist*.

The third column at uniform prices shows the movements of quantities. As compared with 1873, the total in 1907 was 146 per cent. larger, in 1908 it was reduced to 132 per cent., but last year's figure advanced again to 141 per cent. The ratio of values was about $\frac{1}{2}$ point lower than in the preceding year. This was as anticipated in the previous report, as the declarations to the Board of Trade must naturally follow the actual market movements more slowly. The declared value of exports was nearly 4 per cent. lower than in the previous year, thus showing that the fall in 1908 and the rise in 1909 were not fully realised at the time.

Construction of the Tables.

The Table of *Index Numbers* is based on the average prices of the eleven years 1867-77, and the index numbers have been calculated in the ordinary arithmetical way; for instance, English wheat:—

	s.	d.	
Average, 1867-77....	54	6	= 100, average point.
„ '55	74	8	= 137, or 37 per cent. above the average point.
„ 1909	36	11	= 68, „ 32 „ below „

The index numbers therefore represent simple percentages of the average point.

Certain articles which appear to have something in common have been grouped together, with the following result:—

		Example for 1909.	
		Total Numbers.	Average.
1. Vegetable food, corn, &c. (wheat, flour, barley, oats, maize, potatoes, and rice)	With 8 Index Nos.	571	71
2. Animal food (beef, mutton, pork, bacon, and butter).....	„ 7 „	625	89
3. Sugar, coffee, and tea	„ 4 „	201	50
1—3. <i>Food</i>	„ 19 „	1,397	73
4. Minerals (iron, copper, tin, lead, and coal)	„ 7 „	604	86
5. Textiles (cotton, flax, hemp, jute, wool, and silk)	„ 8 „	516	64
6. Sundry materials (hides, leather, tallow, oils, soda, nitrate, indigo, and timber)	„ 11 „	829	76
4—6. <i>Materials</i>	„ 26 „	1,949	75
<i>General average</i>	„ 45 „	3,346	74

The *general average* is drawn from all forty-five descriptions, which are treated as of equal value, and is the simple arithmetical mean as shown above.

Average Prices of Commodities.*

No. of Article } Year.	0	1	2	3	4	5	6	7	8	1-8	9
	Silver.† <i>d. per oz.</i>	Wheat. English Gazette. <i>s. and d. per qr.</i>		Flour. Town Made White. <i>s. per sack (280lbs.).</i>	Barley. English Gazette. <i>s. and d. per qr.</i>	Oats. English Gazette. <i>s. and d. per qr.</i>	Maize. American Mixed. <i>s. per qr.</i>	Potatoes.* Good English. <i>s. per ton</i>	Rice. Rangoon Cargoes to Arrive. <i>s. and d. per cwt.</i>	Vegetable Food. Total	Beef.‡ Prime. <i>d. per 8 lbs.</i>
1895	29 $\frac{7}{8}$	23'1	25'6	23	21'11	14'6	19 $\frac{1}{2}$	80	5'6	—	47
'96	30 $\frac{3}{4}$	26'2	29	25	22'11	14'9	15	55	6'2	—	45
'97	27 $\frac{9}{10}$	30'2	34'6	30	23'6	16'11	14 $\frac{3}{4}$	70	6'9	—	47
'98	26 $\frac{15}{10}$	34	37	33	27'2	18'5	17 $\frac{3}{4}$	82	7'2	—	46
'99	27 $\frac{7}{10}$	25'8	30	26 $\frac{1}{2}$	25'7	17	18	70	7'2	—	49
1900	28 $\frac{1}{4}$	26'11	31'6	27 $\frac{1}{2}$	24'11	17'7	20 $\frac{1}{4}$	78	7'4	—	51
'01	27 $\frac{3}{10}$	26'9	30	26 $\frac{1}{2}$	25'2	18'5	22 $\frac{1}{4}$	78	6'7	—	49
'02	24 $\frac{1}{10}$	28'1	30'6	26	25'8	20'2	25	69	6'2	—	54
'03	24 $\frac{3}{4}$	26'9	31	27	22'8	17'2	22	84	7'3	—	48
'04	26 $\frac{3}{8}$	28'4	33'6	28 $\frac{1}{2}$	22'4	16'4	21 $\frac{1}{2}$	90	6'7	—	48
1905	27 $\frac{13}{10}$	29'8	34	28 $\frac{1}{2}$	24'4	17'4	23	65	6'9	—	47
'06	30 $\frac{7}{8}$	28'3	32'6	26 $\frac{1}{2}$	24'2	18'4	22	67	7'3	—	47
'07	30 $\frac{3}{10}$	30'7	36	29	25'1	18'10	24 $\frac{1}{2}$	88	8'3	—	49
'08	24 $\frac{3}{8}$	32	37'6	31 $\frac{1}{2}$	25'10	17'10	26 $\frac{3}{4}$	81	7'7	—	52
'09	23 $\frac{1}{10}$	36'11	41'6	34 $\frac{1}{2}$	26'10	18'11	27 $\frac{1}{2}$	66	7'1	—	52
Average 1900-09....	26 $\frac{3}{4}$	29 $\frac{1}{2}$	33 $\frac{3}{4}$	28 $\frac{1}{2}$	24 $\frac{1}{4}$	18	23 $\frac{1}{2}$	76 $\frac{1}{2}$	7 $\frac{1}{8}$	—	49 $\frac{1}{2}$
1888-97....	37	29	32	27 $\frac{1}{2}$	25 $\frac{1}{2}$	17 $\frac{1}{2}$	20 $\frac{1}{4}$	73	6 $\frac{3}{4}$	—	47
'78-87....	50	40	43 $\frac{1}{2}$	34 $\frac{1}{2}$	31 $\frac{1}{2}$	21	25	102	8	—	55 $\frac{1}{2}$
'67-77....	58 $\frac{1}{2}$	54 $\frac{1}{2}$	56	46	39	26	32 $\frac{1}{2}$	117	10	—	59
Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.											
1895	49'1	42	46	50	56	56	60	68	55	433	80
'96	50'5	48	52	54	59	57	46	47	62	425	76
'97	45'3	55	62	65	60	65	45	61	67	480	80
'98	44'3	62	66	72	70	71	55	70	72	538	78
'99	45'1	47	54	58	66	65	55	60	72	477	83
1900	46'4	49	56	60	64	68	62	67	73	499	86
'01	44'7	49	54	58	65	71	68	67	66	498	83
'02	39'6	52	54	56	66	78	77	59	62	504	92
'03	40'7	49	55	59	59	66	67	72	72	499	81
'04	43'4	52	60	62	57	63	66	77	66	503	81
1905	45'7	55	61	62	62	67	71	56	67	501	80
'06	50'7	52	58	58	62	70	68	57	73	498	80
'07	49'6	56	64	63	64	72	75	75	82	551	83
'08	40'1	59	67	69	66	69	82	69	76	557	88
'09	38'9	68	74	75	69	73	85	56	71	571	88

* The annual prices are the averages of twelve monthly or fifty-two weekly quotations potatoes of eight monthly quotations, January to April and September to December.

† Index numbers of silver as compared with 60'84*d.* per ounce being the parity between gold and silver at 1 : 15 $\frac{1}{2}$; not included in the general average.

‡ Ment (9-13), by the carcase, in the London meat market.

Average Prices of Commodities—Contd.

No. of Article }	11	12	13	14	15	9-15	16A	16B	17	18A*	18B*	18
	Mutton.		Pork.	Bacon.	Butter.		Sugar.			Coffee.		
Year.	Prime.	Mid- dling.	Large and Small. Average.	Water- ford.	Fries- land, Fine to Finest.	Animal Food. Total.	British West Indian Refining	Beet, German, SS p. c., f.o.b.	Java, Floating Cargoes.	Ceylon Plantation, Low Mid- dling.†	Rio, Good.	Mean of 18A and 18B.
	d. per 8 lbs.	d. per 8 lbs.	d. per 8 lbs.	s. per cwt.	s. per cwt.		s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	s. per cwt.	
'895	58	44	37	54	93	—	10	10	12	98	74	—
'96	53	39	35	50	98	—	10 $\frac{3}{4}$	10 $\frac{1}{2}$	12 $\frac{1}{2}$	95	58	—
'97	55	41	44	59	94	—	9 $\frac{1}{4}$	8 $\frac{7}{8}$	11	95	40	—
'98	52	37	45	58	95	—	9 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{3}{4}$	92	32	—
'99	54	41	40	51	103	—	10 $\frac{1}{2}$	10	12 $\frac{1}{4}$	90	31	—
1900	59	45	44	60	102	—	11 $\frac{1}{4}$	10 $\frac{1}{2}$	12 $\frac{3}{4}$	75	40	—
'01	54	44	49	63	105	—	9 $\frac{1}{4}$	8 $\frac{1}{2}$	10 $\frac{3}{4}$	70	35	—
'02	55	44	48	63	102	—	7 $\frac{1}{4}$	6 $\frac{3}{4}$	8 $\frac{1}{2}$	70	31	—
'03	58	47	44	60	100	—	8 $\frac{1}{2}$	8 $\frac{1}{4}$	9 $\frac{3}{4}$	70	30	—
'04	59	50	39	57	102	—	10 $\frac{1}{4}$	10 $\frac{1}{4}$	11 $\frac{1}{2}$	75	37	—
1905	59	51	46	65	107	—	11	11 $\frac{1}{4}$	12 $\frac{3}{4}$	75	40	—
'06	60	53	49	65	110	—	8 $\frac{1}{2}$	8 $\frac{5}{8}$	10	75	39	—
'07	60	54	45	63	108	—	9	9 $\frac{1}{2}$	10 $\frac{7}{8}$	75	31	—
'08	58	52	43	62	114	—	9 $\frac{3}{4}$	10 $\frac{1}{2}$	11 $\frac{1}{2}$	66†	31	—
'09	52	46	49	71	112	—	10 $\frac{1}{4}$	11	12 $\frac{1}{4}$	70	35	—
Average												
1900-09 ..	57 $\frac{1}{2}$	48 $\frac{1}{2}$	45 $\frac{1}{2}$	63	106	—	9 $\frac{1}{2}$	9 $\frac{1}{2}$	11	72	35	—
1888-07....	56	43 $\frac{1}{2}$	42	61	100	—	12 $\frac{1}{2}$	12 $\frac{1}{2}$	14 $\frac{3}{4}$	97	70	—
'78-87....	64 $\frac{1}{2}$	53	49	71	116	—	17	18	21 $\frac{1}{2}$	78	52	—
'67-77....	63	55	52	74	125	—	23	24	28 $\frac{1}{2}$	87	64	—

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

									*	*	
'895	92	80	71	73	74	544	43	42	113	116	115
'96	84	71	67	68	78	512	46	44	109	91	100
'97	87	75	85	80	75	554	39	39	109	64	86
'98	84	67	87	78	76	542	40	41	106	50	78
'99	86	75	77	69	82	552	44	43	103	48	75
1900	94	82	85	81	82	594	46	45	86	63	74
'01	86	80	94	85	84	596	38	38	80	55	67
'02	87	80	92	85	82	612	30	30	80	48	64
'03	92	85	85	81	80	588	36	34	80	47	63
'04	94	91	75	77	82	584	44	40	86	58	72
1905	94	93	88	88	86	609	47	45	86	62	74
'06	95	96	94	88	88	621	36	35	86	61	73
'07	95	98	87	85	86	618	39	38	86	48	67
'08	92	95	83	84	91	623	43	40	76	48	62
'09	83	84	94	96	90	625	45	43	80	55	67

* Index numbers not included in the general average.

† East India good middling from 1908.

Average Prices of Commodities—Contd.

No. of Article }	19A*	19c*	19B*	19	16-19	1-19	20A	20B	21	22	—	23
	Tea.				Sugar, Coffee, and Tea. Total.	Food. Total.	Iron.			Copper.		Tin.
	Con- gou, Com- mon. d. per lb.	Indian Good Medium. d. per lb.	Average Import Price. d. and dec. per lb.	Mean of 19A and 19B.			Scotch Pig. s. and d. per ton	Cleveland (Middle- brough) Pig. s. and d. per ton	Bars, Com- mon. £ per ton	Chili Bars. £ per ton	English Tough Cake. £ per ton	
Year.												
1895	4½	7½	9'63	—	—	—	44'5	36'1	4½	43	46	63
'96	4	7½	9'55	—	—	—	46'10	38'2	5	47	50	60
'97	4	7½	9'36	—	—	—	45'4	40'7	5½	49	52	62
'98	4½	6½	9'13	—	—	—	47'2	42'2	5½	52	55	72
'99	5½	7¼	8'82	—	—	—	63'9	60'1	7¼	74	78	123
1900	5½	6¾	8'58	—	—	—	69'4	69'3	9	73	77	134
'01	4	5½	7'67	—	—	—	53'9	45'5	6½	66	71	118
'02	3¾	5½	7'20	—	—	—	54'6	49'3	6½	53	57	121
'03	4¼	6½	7'71	—	—	—	52'3	46'3	6½	58	62	127
'04	5	6¾	7'24	—	—	—	51'5	43'3	6½	59	63	127
1905	4¼	5¾	7'24	—	—	—	53'6	49'6	6½	70	74	143
'06	4	5¾	7'40	—	—	—	58'9	53'0	7¼	88	92	181
'07	5¼	7	8'13	—	—	—	63'6	55'7	7½	87	92	172
'08	5½	6¾	7'96	—	—	—	56'1	50'5	6½	60	64	133
'09	5	7¼	8'19	—	—	—	55'1	49'3	6½	59	62	135
Average												
1900-09	4½	6¾	7¾	—	—	—	56½	51	6½	67½	71½	139
1888-97	4½	8	10½	—	—	—	45	38½	5½	50	53	83
'78-87	6½	—	12¾	—	—	—	46	38	5½	55	60	89
'67-77	11¼	—	17¼	—	—	—	69	60	8¼	75	81	105
Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.												
	*		*									
1895	37	—	56	47	247	1,224	64	—	59	57	—	60
'96	36	—	56	46	236	1,173	68	—	61	63	—	57
'97	36	—	54	45	209	1,243	66	—	64	65	—	59
'98	40	—	53	46	205	1,285	68	—	67	69	—	69
'99	49	—	51	50	212	1,241	92	—	88	99	—	117
1900	47	—	50	49	214	1,307	100	—	109	97	—	128
'01	36	—	44	40	183	1,277	78	—	79	88	—	112
'02	33	—	42	38	162	1,278	79	—	74	71	—	115
'03	38	—	44	41	174	1,261	76	—	76	77	—	121
'04	44	—	42	43	199	1,286	74	—	74	79	—	121
1905	38	—	42	40	206	1,316	80		79	93	—	136
'06	36	—	43	40	184	1,303	86		88	117	—	172
'07	47	—	47	47	191	1,360	92		91	116	—	164
'08	47	—	46	46	191	1,371	82		82	80	—	127
'09	44	—	47	46	201	1,397	81		79	79	—	129

* Index numbers not included in the general average.

Average Prices of Commodities—Contd.

No. of Article }	24	25A	25B	26	20-26	27	28	29A	29B	30A	30B	31
Year.	Lead.	Coal.			Minerals. Total.	Cotton.		Flax.		Hemp.		Jute.
	English Pig.	Wallsend Hettton in London.	Newcastle Steam.	Average Export Price.		Middling American.	Fair Dholerah.	St. Petersburg.	Russian, Average Import.	Manila Fair Roping.	St. Petersburg Clean.	Good Medium.
	£ per ton	s. per ton	s. per ton	s. and dec. per ton		d. per lb.	d. per lb.	£ per ton	£ per ton	£ per ton	£ per ton	£ per ton
1895	10 $\frac{3}{4}$	15	8 $\frac{1}{2}$	9.33	—	3 $\frac{3}{4}$ $\frac{7}{8}$	2 $\frac{3}{4}$	26	28	19	25	11
'96	11 $\frac{1}{2}$	15	8	8.85	—	4 $\frac{1}{2}$ $\frac{1}{2}$	3 $\frac{3}{4}$ $\frac{1}{2}$	26	27	17 $\frac{1}{2}$	25	12 $\frac{1}{4}$
'97	12 $\frac{3}{8}$	15 $\frac{3}{4}$	8 $\frac{1}{4}$	8.98	—	3 $\frac{3}{4}$ $\frac{9}{8}$	3 $\frac{1}{2}$ $\frac{1}{2}$	24 $\frac{1}{2}$	27	16	25	11
'98	13 $\frac{1}{4}$	16 $\frac{3}{4}$	10 $\frac{3}{4}$	9.92	—	3 $\frac{5}{8}$ $\frac{1}{8}$	2 $\frac{1}{2}$	24	25 $\frac{1}{2}$	27	25	11
'99	15 $\frac{5}{8}$	18 $\frac{1}{2}$	12	10.72	—	3 $\frac{9}{16}$	2 $\frac{3}{4}$	23	24 $\frac{1}{2}$	41	27	12 $\frac{1}{2}$
1900	17 $\frac{1}{4}$	23 $\frac{1}{2}$	17 $\frac{1}{2}$	16.75	—	5 $\frac{1}{2}$ $\frac{5}{8}$	4 $\frac{3}{16}$	35	30	39	28	14 $\frac{1}{4}$
'01	12 $\frac{3}{4}$	20	12 $\frac{1}{2}$	13.86	—	4 $\frac{1}{2}$	3 $\frac{1}{2}$ $\frac{1}{2}$	38	39 $\frac{1}{2}$	37	27	12 $\frac{3}{4}$
'02	11 $\frac{3}{4}$	18 $\frac{1}{2}$	11 $\frac{1}{4}$	12.29	—	4 $\frac{2}{3}$	3 $\frac{1}{16}$	32	37	43	27	12 $\frac{1}{4}$
'03	11 $\frac{3}{4}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	11.70	—	6.03	4 $\frac{1}{8}$	32	36	36	27	13 $\frac{1}{4}$
'04	12 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{2}$	11.13	—	6.60	5	36	38 $\frac{1}{2}$	38	28	14
1905	14 $\frac{1}{4}$	15 $\frac{1}{2}$	9 $\frac{1}{4}$	10.56	—	5.09	4 $\frac{5}{8}$ $\frac{1}{2}$	32	35	39 $\frac{1}{2}$	29	18 $\frac{1}{2}$
'06	17 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	10.90	—	5.95	4 $\frac{1}{16}$	33	37	41 $\frac{1}{2}$	31	23 $\frac{1}{2}$
'07	19 $\frac{1}{2}$	19 $\frac{3}{4}$	14 $\frac{1}{2}$	12.75	—	6.55	4 $\frac{7}{8}$	30	34	35	31	21
'08	13 $\frac{7}{8}$	18	12	12.77	—	5.72	4 $\frac{1}{16}$	23	29 $\frac{1}{2}$	24 $\frac{1}{2}$	28	15 $\frac{1}{2}$
'09	13 $\frac{1}{2}$	17 $\frac{1}{2}$	11	11.30	—	6.33	4 $\frac{7}{8}$	28	32 $\frac{1}{2}$	24 $\frac{1}{2}$	28	13
Average												
900-09....	14 $\frac{3}{8}$	18 $\frac{1}{4}$	11 $\frac{7}{8}$	12 $\frac{3}{8}$	—	5 $\frac{3}{4}$	4 $\frac{5}{16}$	32	35	36	28	15 $\frac{1}{4}$
888-97....	12	17 $\frac{1}{4}$	9 $\frac{7}{8}$	10 $\frac{1}{4}$	—	4 $\frac{1}{16}$	3 $\frac{1}{16}$	28	28	28 $\frac{1}{2}$	25	13
'78-87....	14	16 $\frac{3}{4}$	8 $\frac{3}{8}$	9	—	6	4 $\frac{1}{4}$	33	34	35 $\frac{1}{2}$	26 $\frac{1}{2}$	15
'67-77....	20 $\frac{1}{2}$	22	12 $\frac{1}{2}$	12 $\frac{1}{2}$	—	9	6 $\frac{3}{4}$	46	48	43	35	19

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

895	52	68	—	75	435	43	41	57	56	58
'96	56	68	—	71	444	48	46	56	55	64
'97	62	72	—	72	460	43	45	55	53	58
'98	65	76	—	79	493	37	37	52	67	58
'99	75	84	—	86	641	40	41	51	87	66
900	84	107	—	134	759	61	62	69	86	75
'01	62	91	—	111	621	53	51	82	82	67
'02	55	84	—	98	576	54	55	74	90	64
'03	57	75	—	94	576	67	61	72	81	71
'04	60	74	—	89	571	73	74	79	85	74
905	70	70	—	84	612	57	62		88	97
'06	85	75	—	87	710	66	71	71	93	124
'07	95	90	—	102	750	73	66	74	85	111
'08	68	82	—	102	623	64	64	68	67	82
'09	66	80	—	90	604	70	72	64	67	68

Average Prices of Commodities—Contd.

No. of Article }	32A	32B	33	34	27-34	35A	35B	35c	36A	36B	37A	37B
	Wool.			Silk.		Hides.			Leather.		Tallow.	
Year.	Merino, Port Phillip, Average Fleece. d.* per lb.	Merino, Adelaide, Average Grease. d. per lb.	English, Lincoln Half Hogs. d. per lb.	Tsatlee. s. per lb.	Textiles. Total.	River Plate, Dry. d. per lb.	River Plate, Salted. d. per lb.	Average Import. d. and dec. per lb.	Dress-ing Hides. d. per lb.	Average Import. d. per lb.	St. Peters-burg Y.C. s. per cwt.	Town. s. per cwt.
1895	12	5 ⁵ / ₈	12	10	—	7 ¹ / ₈	6 ¹ / ₄	4.76	13 ¹ / ₂	13 ⁵ / ₈	48	23
'96	13	6 ³ / ₈	11 ¹ / ₂	10 ¹ / ₂	—	6 ³ / ₈	5 ¹ / ₂	4.89	13 ¹ / ₂	13 ¹ / ₈	48	21
'97	12 ¹ / ₄	6	9 ⁵ / ₈	10 ¹ / ₄	—	6 ¹ / ₂	5 ¹ / ₂	4.93	13 ¹ / ₂	12 ³ / ₄	40	20
'98	13 ¹ / ₄	6 ³ / ₈	8 ³ / ₄	10 ¹ / ₂	—	7	6 ¹ / ₈	5.04	13 ¹ / ₂	13 ³ / ₈	40	22
'99	17 ¹ / ₄	8 ¹ / ₂	8 ¹ / ₄	13	—	7 ³ / ₈	—	4.94	13 ¹ / ₂	13 ¹ / ₂	—	25
							6 ¹ / ₄					
1900	15 ³ / ₄	7 ⁷ / ₈	7 ⁷ / ₈	13	—	8 ¹ / ₈	6 ¹ / ₄	5.31	14	13 ³ / ₈	—	27 ¹ / ₂
'01	13	6 ³ / ₈	6 ³ / ₈	10 ¹ / ₂	—	7 ¹ / ₂	6	5.34	14	13 ¹ / ₂	—	28
'02	15	7 ⁵ / ₈	6 ¹ / ₂	11	—	7 ⁵ / ₈	6 ³ / ₈	5.52	14	14 ¹ / ₂	—	32 ¹ / ₂
'03	16	8 ¹ / ₄	7 ¹ / ₄	13 ¹ / ₂	—	8	6 ¹ / ₂	5.75	14	15 ¹ / ₂	—	29 ¹ / ₂
'04	16	8	10 ¹ / ₈	12 ¹ / ₂	—	8 ¹ / ₄	6 ³ / ₄	5.66	14	15	—	26 ¹ / ₂
1905	17 ¹ / ₄	8 ³ / ₄	12 ³ / ₈	12 ³ / ₄	—	9	7 ¹ / ₄	5.98	14	15 ¹ / ₄	—	26 ¹ / ₂
'06	18	9 ¹ / ₄	13 ³ / ₈	13 ³ / ₄	—	10	7 ³ / ₄	6.52	16 ¹ / ₂	16	—	30 ¹ / ₂
'07	18	9 ¹ / ₈	12 ¹ / ₄	15 ¹ / ₄	—	9 ³ / ₄	7 ³ / ₈	6.98	16	17 ⁷ / ₈	—	34 ¹ / ₂
'08	15 ³ / ₄	7 ⁷ / ₈	8 ¹ / ₂	10 ¹ / ₂	—	8 ¹ / ₄	5 ⁷ / ₈	6.30	14 ¹ / ₂	17 ¹ / ₄	—	30 ¹ / ₂
'09	17 ¹ / ₂	9 ¹ / ₂	9	9 ³ / ₄	—	9 ¹ / ₄	7	6.73	15	17 ¹ / ₄	—	30 ¹ / ₂
Average												
1900-09....	16 ¹ / ₄	8 ¹ / ₂	9 ³ / ₈	12 ¹ / ₄	—	8 ⁹ / ₁₀	6 ³ / ₄	6 ¹ / ₈	14 ¹ / ₂	15 ¹ / ₂	—	29 ¹ / ₂
1888-97....	14	6 ¹ / ₂	10 ¹ / ₂	12	—	6 ¹ / ₈	5 ¹ / ₄	5	13 ¹ / ₂	14 ¹ / ₄	43	25 ¹ / ₂
'78-87	18 ¹ / ₂	8 ³ / ₈	11 ³ / ₄	15	—	8 ³ / ₈	6 ³ / ₄	6 ¹ / ₂	15	17	41	35 ¹ / ₂
'67-77....	21 ¹ / ₄	9 ¹ / ₈	19 ³ / ₄	23	—	9	7	6 ⁷ / ₈	16	18 ³ / ₄	45	45

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

1895	57	61	43	416	84	—	84	—	79
'96	62	58	46	435	77	—	84	—	77
'97	59	49	45	407	75	—	84	—	67
'98	64	44	46	405	82	—	84	—	69
'99	83	42	57	467	85	—	84	—	56
1900	76	40	57	526	90	—	87	—	61
'01	62	35	46	478	84	—	87	—	62
'02	72	32	48	489	87	—	87	—	72
'03	78	37	59	526	91	—	87	—	65
'04	77	51	54	567	94	—	87	—	59
1905	84	63	55	577	95	—	84	—	59
'06	87	68	60	643	103	—	94	—	68
'07	88	62	66	619	105	—	97	—	77
'08	76	43	46	498	90	—	91	—	68
'09	87	46	42	516	100	—	93	—	68

* Port Phillip fleece washed nominal since 1895, exactly in proportion with the value of clean wool.

Average Prices of Commodities—Contd.

No. of Article } Year.	38	39	40A	40B	41	42	43	44	45A	45B	35-45	20-45	1-45
	Oil.		Seeds.		Petro- leum.*	Soda.	Indigo.		Timber.		Sundry Mate- rials. Total.	Mate- rials. Total.	Grand Total.
	Palm.	Olive.	Lin- seed.	Lin- seed.	Refined.	Crystals.	Nitrate of Soda.	Bengal, Good Con- suming.	Hewn, Average Import.	Sawn or Split, Average Import.			
	£ per ton.	£ per ton.	£ per ton.	s. per qr.	d. per gall.	s. per ton	s. per cwt.	s. per lb.	s. per load.	s. per load.			
1895	23	36	20 $\frac{1}{4}$	37	6	39	8 $\frac{1}{4}$	4 $\frac{1}{4}$	37	42	—	—	—
'96	22	30	17 $\frac{1}{2}$	33	5 $\frac{1}{2}$	42	8	4 $\frac{1}{4}$	40	44	—	—	—
'97	22	31	15	33	4 $\frac{3}{4}$	51	7 $\frac{3}{4}$	4	41	47	—	—	—
'98	23	32	16 $\frac{3}{4}$	36	5 $\frac{1}{8}$	54	7 $\frac{3}{4}$	3 $\frac{1}{2}$	42	47	—	—	—
'99	25	33	20	40	6 $\frac{1}{4}$	56	7 $\frac{3}{4}$	3 $\frac{1}{2}$	40	49	—	—	—
1900	27 $\frac{1}{2}$	36	30 $\frac{1}{2}$	54	6 $\frac{3}{8}$	62	8	3 $\frac{1}{2}$	41	56	—	—	—
'01	26	38	30	53	6 $\frac{1}{2}$	65	9	3 $\frac{3}{8}$	39	52	—	—	—
'02	27 $\frac{1}{2}$	34	28	50	6 $\frac{1}{4}$	64	9 $\frac{3}{4}$	3 $\frac{1}{4}$	39	51	—	—	—
'03	28	33	21	39	6 $\frac{1}{4}$	64	9 $\frac{3}{4}$	3 $\frac{1}{4}$	39	54	—	—	—
'04	27 $\frac{1}{2}$	32	16	33	6 $\frac{1}{8}$	64	10 $\frac{1}{4}$	2 $\frac{7}{8}$	36	51	—	—	—
1905	27	36	18	39	5 $\frac{5}{8}$	64	11	2 $\frac{7}{8}$	38	51	—	—	—
'06	30 $\frac{1}{2}$	39	20 $\frac{3}{4}$	43	6 $\frac{1}{2}$	64	11 $\frac{1}{4}$	3	40	55	—	—	—
'07	33	43	23 $\frac{1}{4}$	44	6 $\frac{3}{4}$	64	11 $\frac{1}{4}$	3 $\frac{1}{4}$	40	57	—	—	—
'08	27 $\frac{1}{2}$	43	22 $\frac{1}{4}$	45	6 $\frac{3}{8}$	61	10 $\frac{1}{2}$	3 $\frac{3}{8}$	36	53	—	—	—
'09	29	50	24 $\frac{3}{4}$	49	6 $\frac{3}{8}$	61	10 $\frac{1}{4}$	3 $\frac{1}{4}$	34	54	—	—	—
Average													
1900-09....	28 $\frac{1}{2}$	38 $\frac{1}{2}$	23 $\frac{1}{2}$	45	6 $\frac{3}{8}$	63 $\frac{1}{2}$	10 $\frac{1}{2}$	3 $\frac{1}{4}$	38	53 $\frac{1}{2}$	—	—	—
1888-97....	24 $\frac{1}{2}$	36	19 $\frac{1}{2}$	39	5 $\frac{1}{2}$	52	8 $\frac{3}{4}$	4 $\frac{1}{2}$	40 $\frac{1}{2}$	44 $\frac{1}{2}$	—	—	—
'78-87....	32 $\frac{1}{2}$	40	23	46	6 $\frac{7}{8}$	62	12 $\frac{1}{2}$	6	47	47	—	—	—
'67-77....	39	50	30	60	12 $\frac{1}{2}$ *	92	14	7 $\frac{1}{4}$	60	54	—	—	—

Index Numbers (or Percentages) of Prices, the Average of 1867-77 being 100.

	59	72	64	48	42	59	59	69	719	1,570	2,794
1895	59	72	64	48	42	59	59	69	719	1,570	2,794
'96	56	60	56	44	46	57	59	74	690	1,569	2,742
'97	56	62	53	38	56	55	55	77	678	1,545	2,788
'98	59	64	59	41	59	55	48	78	698	1,596	2,881
'99	64	66	67	50	61	55	48	78	714	1,822	3,063
1900	71	72	94	54	67	57	48	85	786	2,071	3,378
'01	67	76	92	52	71	64	47	80	782	1,881	3,158
'02	71	68	87	50	70	70	45	79	786	1,851	3,129
'03	72	66	67	50	70	70	45	82	765	1,867	3,128
'04	71	64	54	49	70	73	40	76	737	1,875	3,161
1905	69	72	63	45	70	79	40	78	754	1,943	3,259
'06	78	78	71	49	70	80	41	83	815	2,168	3,471
'07	85	86	75	54	70	80	45	85	859	2,228	3,588
'08	71	86	75	54	66	75	46	78	800	1,921	3,292
'09	74	100	82	51	66	73	45	77	829	1,949	3,346

* Petroleum as compared with the average from 1873-77 only.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*La petite propriété rurale en France. Enquêtes monographiques (1908-09).* 348 pp., 8vo. Paris: Imprimerie nationale, 1909. Price 3 fr. 50 c.

A new inquiry into the condition of small agricultural holdings in France is a welcome addition to the literature of a perennial topic of economic debate. To deal, however, at all exhaustively with the volume of *enquêtes monographiques*, which embodies the results of the task just accomplished by M. Ruau, the Minister of Agriculture of the Republic, would need the limits of a reasoned statistical paper rather than the scope of a current review. There are not only questions of statistical method and presentation, arising immediately from the form of the official report, but matters also of political and social import involved, tempting a critic into excursions on the various controversies revived by this publication. Evidence of the attention provoked in France may be seen in recent debates in the French parliament, in the speeches of the Minister concerned, and in the explanatory lecture he seems to have given with reference to the nature of this inquiry at the Musée Social. The text of this address is not in our hands, though its bearing on the question of land distribution is examined in an able article, which so competent an authority as M. Alfred de Foville has recently contributed to the *Economiste Français*. It would have been a material advantage to the study of the volume before us had its statistical features been elaborated, and its conclusions focussed, as seems to have been done by the Minister in these *obiter dicta*. In a purely statistical journal criticism is provoked by the ministerial preference avowed in the introductory words of this report for the "*système monographique*" over the "*méthode statistique*"; nor is the misgiving lessened when we find M. Ruau, in the parliamentary discussion, alleging the statistical method to be "superannuated for the practical investigation" of a subject of this nature. If no more is meant than a caution against the unwary employment of general averages

founded on widely varying units of area, we might agree that earlier students of the problem of land subdivision may have missed something of the essential variety of local type presented by the grouping of holdings in the French agricultural system. But what is gained by emphasising the local differentiation is surely lost by the difficulty of grasping the net results of a long series of isolated pictures here made to pass before the eye with the speed of a cinematograph performance, wherein we are presented with the views of local experts in 87 separate Departments, and these again elaborately subdivided with admirable and scrupulous care into numerous agricultural divisions or groups of distinctive rural areas, wherein great and little holdings are often far from meaning the same thing. It may be hypercritical to find fault with an investigation which is in itself of permanent value as providing a veritable mine of collected impressions, but the arrangement alphabetically in dictionary shape is better suited for leisurely consultation by a patient student than for those who desire to gather rapidly, and in contiguous geographical regions, the results of the reports. Rightly employed, we cannot, moreover, but feel that the statistical method may not after all be so wholly inadequate to the representation of the balance of locally varying conclusions. Indeed, in the synoptical tables appended a certain degree of statistical summation of opinions, if not of facts, appears, for there is no getting away altogether from the arbitrament of figures. In these supplementary tables each department is regarded as a unit of equal nature, and those where "small holdings" are increasing or otherwise over the last twenty years of agricultural history are enumerated. Numerically a somewhat rough summary based on these tables may perhaps be constructed—at least in regard to three of the questions put. This may not unfairly suggest the drift of the response to the ministerial *questionnaire*, and would stand thus:—

Departments.	In number of small properties.	In proportion of area covered by small properties.	System of <i>faire valoir indirecte</i> , i.e., tenant farming or <i>métayage</i> .
Increasing	42	52	12
Diminishing	13	5	30
Stationary	17	19	14
Unclassified owing to local variety of experience..... }	15	11	31
Total	87	87	87

These figures, so far as they go, certainly confirm the Minister's own antecedent view, and his firmly expressed conviction of the position as it now stands, that the *petite culture* is increasing in favour in France, that it grows both in the absolute number of small properties and in the relative extent of the surface occupied by them, while some disfavour is on balance seemingly attached to the letting of land to tenants or *métayers* as opposed to cultivation by the owner. A similar endeavour to summarise the replies as to the relative

"inferiority," "equality," or "superiority" of small holdings as regards (a) the "means of production" they employ, and (b) as to the economic results obtained, would, for the 85 departments accounted for under these heads, proclaim the "means of production" at the command of the small holder to be *inferior* to that of the larger cultivator in 29 cases, *equal* in 15, *superior* in 27, while a balance of 14 districts remained unclassified owing to local variety. On the other hand, the "economic results" are reported to be *inferior* in only 16 departments, *equal* in 9, and *superior* in no less than 47, some 13 others being unclassified.

The qualifications which suggest themselves to this form of presenting the matter lie in the acknowledged widely varying limit of "small" holdings in different departments, of which striking examples are to be found in the monographs, and again in the quite unequal extent to which the *petite culture* obtains in one department or another, so that all these administrative divisions may not be of *equal* weight on the issues raised. Perhaps one may also confess to some latent suspicion that despite the care here evidently taken in the conduct of this inquiry to keep distinct the separate unit of a *petite propriété* from a *petite exploitation*—the old source of frequent error in former reports and statistics—the confusion between a unit of ownership and a unit of cultivation may not have been wholly eradicated.

Despite, therefore, M. Ruau's assertion that it is "no longer possible" to classify land holdings as small, medium, or large, according to the sole criterion of superficial area, we may be pardoned for voicing an obsolete and unregenerate statistical prejudice in pleading that the actual position and comparative movement might have been still more clearly established could we have had, besides the views of the qualified local experts—Departmental professors and presidents of chambers of notaries—a general report framed on uniform arithmetical basis of fact which could be placed clearly alongside the older statistical inquiries. This would have furnished a more or less exact number of units of ownership, on the one hand, and of units of cultivation on the other, now and at earlier dates, such as those of the discontinued agricultural *enquêtes* of 1882 or 1892; while these data again could have been co-ordinated and brought into relation with the conclusions of the occupation census showing the present numbers of the owner farmers, those renting land, and those who combined with either ownership or tenant farming (as this volume shows a certain proportion of the small holders still do) the task of labouring for hire on the lands of others. So long as these comparative data are absent, one is at some loss to decide how to reconcile M. Ruau's own allusions in the parliamentary debate, as to the number of separate families who may be found farming on the estates of a single owner with the opinion which is indicated in the third column of the above table of the general decline in this form of indirect culture.

As M. de Foville, moreover, shows, M. Ruau himself, elsewhere than in this volume, compares the data as to ownership in 1908 offered by a separate inquiry conducted by the Ministry of

Finance and the figures of the agricultural *enquête* of 1892. If these are put side by side, the total number of properties is less, and not greater, in the aggregate, and varies widely in the several categories of holdings. Thus a 3 or 4 per cent. diminution on the total covers a reduction of $6\frac{1}{2}$ per cent. in estates under $2\frac{1}{2}$ acres, but only half as much on holdings between that area and 25 acres, with 5 per cent. and 12 per cent. increases in the two next higher grades, and again at the other end of the scale a drop of 11 per cent. on estates over 250 acres. That this again has to be set against a somewhat different deduction if the areas of these classes and not their number be contrasted, is perhaps only another instance of the intricacy of the problem—for here *petite propriété* seems to claim 11 per cent. more area than sixteen years before, and the medium estates 14 per cent. more—reductions obtained by the reduction of 12 per cent. in the surface, still the largest portion of French territory, some 40,000,000 acres, which remains in over 250-acre holdings.

One must not, however, despite these strictures, omit to say that although M. Ruau's monographic pictures do not solve all the difficulties suggested, they undoubtedly make most suggestive reading. Perhaps the most statistically interesting tables are those reported by the Departmental Professor of the Seine-et-Marne—where he shows how the small holding may vary from an average of 1 hectare in one district to 9 hectares in another, and a *grande propriété* may run from 20 hectares (just 50 acres or the limit of an English small holding) to 85 hectares, or over four times that surface. Here, as elsewhere, it is pointed out how the very small holder may be, as he is called, the "enemy of progress," and be poorly equipped for his business, and yet gain a certain economic advantage over his larger rival from the unpaid but energetic and conscientious labour he is able, by the hard toil of himself and his family, to apply, as compared with the insufficient labour staff with which the large holder has too often to contend. In the Seine-et-Oise, a small holding in the district where this form of agriculture prevails is represented by a plot of $2\frac{1}{2}$ acres only, whereas there are other regions of the same department where the title of small is locally applied to a farm of 25 acres, or to one of even twice that size. But space forbids quotations of the many interesting types of districts here offered to the investigator of French rural geography, while the notes under all of the 87 chapters offer a multitude of interesting replies as to the local changes in the value of land and the position of the small holder in wine growing as distinct from grain growing regions. One general conclusion, at all events, all the facts now collected establish, and that is that neither of the contending schools of opinion have proved their case. The collectivist and socialist allegations that the large properties in France have squeezed out the small are obviously wrong, on the one hand, while the theoretical alarms of the school of economists, who prophesied ruin to the State by the *morcellement* of the land are left equally without support on the other.

P.G.C.

2.—*Memorandum on some of the results of Indian administration during the past fifty years of British rule in India.* (Cd. 4956.) Eyre and Spottiswoode, 1909. Price 3½*d.*

The practice of official stock-taking is familiar to students of Government publications. No long ago we had the past fifty years of public health and social conditions reviewed from the standpoint of the Local Government Board. We now have the survey of a wider field before us. The Indian Government has long been well in the front rank for the frequency and the scope of the periodical surveys it provides of its actions and their results. Annually, the "Moral and Material Progress" is reported by the Secretary of State for this country, or, as the report before us more correctly calls it, this "congeries of countries." The inclusion of the first adjective in the title above quoted was probably a concession to contemporary sentiment at the time the issue was first ordained; otherwise it would appear to be one of those occurrences the origin of which is "wropt in mystery." A more interesting, and, from the statistical standpoint, more valuable, report is the decennial review, appearing under the above title. The longer the period covered, the more striking, of course, is the change that can be noted, especially when, as in the case of India, so well-marked a starting point is provided as the assumption of direct administration by the Crown in 1858. The first thirty years of this period were reviewed in 1889 by the master hand of the late Sir Charles Bernard, himself an active and distinguished agent in many branches of the work he was called upon to describe. Twenty years more have been added to the annals of India, and the completion of the half-century is signalised by the publication of a brief review of what is justifiably claimed therein to be an "earnest and fairly successful attempt to solve political, social and material problems of much difficulty and complexity." It is clear that such a subject cannot be dealt with otherwise than in outline in the space of 34 pages, and the compilers have wisely taken precautions against the interference of the trees with the view of the forest as a whole. The merit of the work, therefore, cannot be deemed to be materially affected by a few lapses from statistical orthodoxy in the way of selection or combination, by means of which a bit of colour is thrown in to enliven some otherwise unpicturesque though solid evidence of progress. Details are in all cases obtainable from the original *data* in other publications. There are people, of course, who will stigmatise the whole work as the outcome of official optimism, and merely the justification by a bureaucracy of its own conduct, and will point out in the title the limitation implied by the words "some of" the results of the administration in question, hinting that a very different tale is told by the results not brought upon the record. The nation generally, however, is healthily disposed to base its verdict upon the "vindemia" as a whole, and, judged by this standard, the administrators of India need be in no doubt as to the decision. Indeed, there are several important facts for which a place could not be found in a review of this sort, but which

strikingly corroborate the evidence given by figures as to the improvement which has taken place since the Mutiny in the material conditions of life throughout the community. A prominent place is given in the Report, and rightly, to the special rapidity of the progress which has characterised the last ten or fifteen years, in spite of the drawbacks of plague and famine. So far as this quickening of the pace has been due to the direct action of the State, and much of it is attributable to such effort, the results have inevitably been accompanied by a considerable increase in the public expenditure. This, in turn, has been almost counterbalanced by the expansion of the main permanent sources of revenue, even taking into account the reduction of the rate of the Salt tax and the abandonment of the greater part of the receipts from Opium. Recourse to loans, too, has been sparse, except for railway and canal construction, which, so far from adding to the financial burden, tend to alleviate it. In a work of this sort, prepared under the auspices of so strong a personality as that of the present moulder of Indian policy, it would be too much to expect an entire absence of bias in certain directions, and this appears in the prominence given to constitutional changes, the result of which have yet to be appraised, as well as in the habit of occasionally straying from the beaten path of accomplished fact in order to drop into prophecy, or to indulge in the balmy anticipation of blessings yet to be realised. But the work, as a whole, can be heartily recommended as a succinct and trustworthy exposition of work done and the lines upon which it is being conducted. J.A.B.

3.—*Le conflit des doctrines dans l'économie politique contemporaine.* Par Charles Brouilhet. viii + 306 pp., crown 8vo. Paris: Félix Alcan, 1910. Price 3 fr. 50 c.

There was a time in this country, about the middle of the nineteenth century, when Political Economy could be described with tolerable accuracy as a compact body of authoritative, consistent doctrine. Although Professor Brouilhet hints that in scientific inquiry generally regarded, the various methods of approach by which minds of different type address themselves to the study of the phenomena it is their duty to observe must necessarily make the prospect shadowy and remote, it is barely possible that the future may reproduce this seeming harmony by patching up an adequate reconciliation between different views. But, welcome as M. Brouilhet says might be the appearance of the genius who could reveal and announce the definitive economic creed from which the proper principles of social action might invariably be deduced, he certainly has not yet arrived. The conflicting nature of the chief varieties of doctrine which are suggested to French contemporary economists by their respective views of social facts is patent, and the divergence has perhaps at no period been so acute as it is now. To the description of the main modes of speculative thought and practical instruction which are thus opposed at the present day in France this study is devoted.

The essay is characterised by a welcome independence of

opinion, based on discriminating study, although the sympathies of the author evidently incline most favourably to what he distinguishes as the school of "intervention and of solidarity," represented by those Radicals of whom M. Léon Bourgeois is a conspicuous protagonist. This school stands midway between the "Liberal School" of economists and the "Socialists." But although M. Brouilhet regards the latter school as "catastrophic," he relegates to an additional, distinct and final section of his treatises the Syndicalists, who form the extreme wing of the party as a whole. They believe in the "class war," to be conducted with remorseless and unrelenting energy to an early final issue by the weapon of the "general strike." Contrasted with the violent opinions and uncompromising policy of this section the "Socialist School" here so-called has no less good a title, as our author holds, to the designation of being "scientific" than the other two bodies of opinion considered in his book; and we do not think that the individual members of this particular class can have any reason to complain of the treatment accorded to them in the chapters where they are described. It is fair, it is respectful, and it is even sympathetic. M. Brouilhet is, in fact, disposed to assign more weight in the scales of his appraising judgment to the replies offered to some criticism directed against their constructive schemes than to the original objections which they thus try to answer. Some of these animadversions he dismisses summarily as trivial when compared with the main purpose that is contemplated by such Socialists. Others, he considers, are on the whole satisfactorily met.

To the "Liberal School" he is favourably disposed, though he is not, perhaps, less deferential in his attitude. He candidly admits that it must be reckoned with as a very potent force in moulding influential thought even at the present day. But he urges, with persuasive cogency, that, while this economic creed, still known generally as "orthodox," began by being "Liberal," it has ended, in effect, by becoming, theoretically and practically, "Conservative." Its very strength is derived from its close connection with those who control the power attaching to the ownership or use of capital in the modern world of enterprise; and it virtually commends and supports the economic *status quo*. It deprecates the interference of the State with the liberty of the individual with more emphasis and no less persistence than were exhibited in the palmy days of the orthodox economists in England by some of their irresponsible disciples. Nevertheless, M. Brouilhet writes, it would be a serious mistake to think that the Liberal School is, in his country at least, in its decline. It is, on the contrary, "extremely powerful"; for its strength depends on the important influence exerted by the interests for which it offers an apology. Yet, as he observes, it does not budge an inch from its strait standpoint; and while the Physiocrats from whom it sprang, were Liberals and Reformers, the "Liberal" School, so called, has now become essentially conservative, defending stoutly the existing order of affairs in economic matters and affirming in effect that all is for the best in the best of all possible worlds.

Yet curiously enough, as M. Brouilhet argues, the Physiocratic account of society, as it was summarised in Quesnay's famous Table, with its three categories of the producers, the proprietors of the land, and the middle parasitic class which lived by rendering services to the others, is no inaccurate picture of the broad conditions now prevailing, and a justification is thereby afforded for that opportune intervention of the State which is the motto of the school of "solidarity." We may dissent from our author, but he certainly shows his independence in the interpretation placed on the statistical evidence put forward by the Liberal School to support their favourite thesis that the tendency of economic forces is in the direction of an increased equality in the distribution of the wealth produced in the advancing countries of the modern world. He lays stress upon what he considers the ugly fact of an existing inequality, and he maintains that it is clearly demonstrated by these very figures. In this connection it may be noted that he cites Mr. Chiozza Money with approval to show that the general position in England is not different from that in France, and similarly he endeavours to establish a parallel between the reforms contemplated or achieved by French Radicals and those accomplished or designed by advanced English Liberals.

His independence is shown again by his preference of the Prussian mode of taxing income to that followed in this country and by the combination of his strong dissent from any settlement of the rate of wages by the State with his acquiescence in, or recommendation of, the compulsory limitation of the hours of labour. His account of the different items in the comprehensive programme of social radicalism is both informing and judicial, and the chapter dealing with this subject is not the least interesting of those contained in the essay. Under the successive headings, of new methods in the taxation of income and capital, of legislation protecting labour, of social insurance, of State monopolies, and of workmen's unions, he has described the chief modes in which effect is given to the guiding principles of this particular school of economic thought, with which, as we have said, his sympathies are most pronounced. English readers who do not agree with his opinions will yet derive instruction from their statement; and the picture he presents of French economic thought is painstaking and illuminating. It is firmly and compactly drawn.

L.L.P.

4.—*Economic and fiscal facts and fallacies.* By Sir Guilford Molesworth, K.C.I.E. xii + 292 pp., crown 8vo. London: Longmans, Green and Co., 1909. Price 3s. 6d. net.

Sir Guilford Molesworth states in his preface that he contemplates a twofold object in publishing this book. The one is to "present, in a more connected form," the views advanced by him in various detached shapes "on economic and fiscal questions during a period extending over more than a quarter of a century." The other object is to "expose the manner in which the followers of the 'Manchester School' of economics have misused and misapplied" the "truths of political economy." His readers are thus

prepared at the outset for what they are to expect; and, while we have not been able to avoid an impression of discursiveness suggested by the numerous short chapters, amounting to 44 in all, comprised in the 300 pages of which the work consists, and the thread of "connection" seems sometimes to be somewhat abruptly broken, or at any rate to lead by no very obvious or direct a transit from one varied topic to another, yet the evident firmness and intensity of conviction by which the author is impelled throughout, lend a sustaining interest to his treatment; and he certainly knows how to strike a succession of hard blows at the weak points in the logical armoury of his opponents.

Fiscal reformers will accordingly discover in these pages many an effective argument to use against "convinced Free Traders," and more detached observers will, we think, appreciate the determination with which Sir Guilford pushes home a welcome protest against the "elevation" of a certain class of "fiscal tenets to a species of religion." Most informed economists will share, unless we are mistaken, the incredulous surprise and instinctive but justified distrust with which he regards such references as those made recently on the political platform by a statesman of the intellectual training and philosophical capacity of Mr. Birrell to the "eternal truths of the Economic Law." Nor, they will admit, has our author's study of the actual writings of the more famous economists themselves been limited to so confined a range and so hasty a perusal as the utterance we have quoted might seem to indicate has been the case with a busied Cabinet Minister; and, where the verdict which he passes is unfavourable, it is not capricious or unfounded.

Sir Guilford's acquaintance with economic history is no less extensive than his knowledge of economic theorising; and his account, for instance, of the Corn Laws corresponds with that given by Professor Nicholson in a course of lectures delivered recently at Cambridge. While the Edinburgh Professor and the writer of the book before us differ somewhat in their fiscal creed, they agree in dismissing as inadequate or incorrect the description of the actual consequences of the Corn Laws which has been habitually put forward, or at least lightly accepted without serious examination, by the popular Free Trader. So far from raising the price of corn this particular legislation seems to have tended steadily in the opposite direction. The cereal seems to have been cheaper on the average than it would otherwise have been. What is perhaps more novel in Sir Guilford's own discussion of this matter is his connection of the resumption of cash payment by the Bank of England and of the famous Act of 1844 with the distress of the period designated picturesquely but somewhat extravagantly as the "Hungry Forties," and here, as in other chapters of the book, we discover traces of our author's well-known sympathy with a second heresy (to wit, bi-metallism) which has nevertheless been adopted by economists of established fame and acknowledged erudition and ability.

It is in a similar vein of dexterous dialectical acumen that the incidence of an import duty is considered, and here, as elsewhere, economic theory is ruthlessly compelled to submit to the crucial test

of recorded fact. Perhaps no chapter, however, in the book is more characteristic of the bent and capacity of the author than that entitled "Prophecies," in which the assured predictions of Free Traders are confronted with their ascertained non-fulfilment. It will be evident from the summary account which we have given that Sir Guilford Molesworth makes no pretence to immunity from bias; that he is troubled by no squeamish anxiety to spare those whom he criticises any portion of the blame which in his opinion they have richly earned; and that he thinks as he writes with all the polemical vigour and convinced determination of an eager controversialist. Nevertheless, while he may confirm Tariff Reformers in the faith they have embraced, he is not an assailant whom Free Traders can afford to leave alone or will easily thrust aside. He knows, as we have said, the weak spots in their defences, and he addresses a direct onslaught with remorseless energy against those places. And, although he might be accused of taking his readers from one point to another of an extensive area and to be guilty in the process of some repetition of his views, he yet contrives by the enthusiasm he commands and the assurance he instils to arouse and retain a vivid interest in the arguments which he advances in succession. His book is certainly an animated contribution to the fiscal controversy which will receive, and will deserve, attention.

L.L.P.

5.—*Essays in Eugenics.* By Sir Francis Galton, F.R.S. ii + 109 pp. London: The Eugenics Education Society, 1909. Price 1s. 6d.

In this volume the Eugenics Education Society has reprinted seven essays on Eugenics by Sir Francis Galton in order to show something of the progress of Eugenics during the last few years, and to explain the views of the founder of Eugenics upon its aims and methods. The essays are arranged in chronological order, and begin with the Huxley Lecture of 1901, delivered before the Anthropological Institute, in which Sir Francis Galton deals with the distribution and descent of ability, the possibility of the issue of diplomas for civic worth, and the correlation between promise in youth and subsequent performance, since worked out by Schuster and published as a Galton Eugenics Memoir. Then follow four Papers read before the Sociological Society, "Eugenics, its Definition, Scope and Aims"; "Restrictions in Marriage"; "Studies in National Eugenics"; and "Eugenics as a Factor in Religion." The reprinting of the Herbert Spencer for 1907, "Probability, the Foundation of Eugenics," is welcome. It gives an interesting account of the history of Eugenics and a simple description, aided by useful diagrams, of the principles on which modern statistical methods are based. The volume concludes with a Paper on "Local Associations for Promoting Eugenics."

Altogether, the volume supplies a decided want, and will be found useful to all who are interested in this new science. D.H.

6.—*The economics of railway transport.* By S. C. Williams, B.A. x + 308 pp., sm. 8vo. Macmillan and Co., 1909. Price 3s. 6d.

He would indeed be a bold writer who, in the compass of one small volume, dared attempt to discuss and theorise upon the necessary characteristics of a railway, whether in England or India, much less upon the railways of the whole world. At times the reader is under the impression that the text is the economics simply of British railway transport, seeing that several of the problems peculiar to Great Britain alone are therein referred to at considerable length.

The historical survey of the science of transport as applied to railways is not only admirably set out in an introductory chapter, but is kept well to the front throughout the work. One welcomes the prominence given to the historical side which is so frequently ignored in a book of this character, and is in many cases the whole explanation of the existence of a practice which has evolved itself from a primitive method of transport.

The author is rightly proud of the enormous growth of passenger travel, with its attendant luxuries and comforts, in some cases possibly at a non-remunerative figure; but it is doubtful if the suggestion that the thought and ingenuity bestowed by the railway authorities for the expansion of the passenger business has not been at the expense of the more remunerative class of traffic, viz., merchandise. The one has a voice to make itself heard, the other has not. If the same amount of energy had been bestowed upon the two classes of transport, is it not reasonable to suppose that greater progress would have been possible in the handling and conveyance of goods? Electric traction as applied to railways is too recent a change to justify one in drawing definite deductions in any comparisons of working costs, but its possibilities are indeed great.

The real curse of the British railways is the private wagon. There is no factor which tends so much against a reduction of transport costs than this relic of 1853, "that railways were expected to be what they are in contemplation of law, new highways freely open to the public to pass with engines, carriages, and wagons at their own discretion." The existence to-day of this anomaly is an important obstacle to standardisation of rolling stock in this country, and in the case of coal traffic, which demands the haulage of each empty wagon back to the same colliery from which it originated, instead of being available for the conveyance of other materials on the return journey, it becomes the immediate cause of an enormous waste of power and energy in the economics of railway transport.

The work is subdivided into three main parts—construction, operation, and economics. It is admirably expressed throughout, and is a clear and well-stated case for lay readers of the complex problem involved in the consideration of the genesis and successful working of any railway, in all its relationships with both State and people. Incidentally, one must wonder how it became at all possible to manage such a sensitive machine as a railway. The analysis of the work, on the whole, is good, and will fascinate the student as it

interests the expert. More might, however, have been said in the chapters on construction in which the author deals with some of the physical attributes of a railway.

Although the generic term "transport" may be defined as the conveyance of persons or goods from one place to another, yet the use of such an abstract word as "transport" gives quite a misleading air of simplicity to what is really a congeries of operations of the most diverse kind. Railways, in fact, produce a far greater variety of commodities than most industrial undertakings. The imposition of State supervision on railway transport is at all times either reasonable or unreasonable to the extent that the officials upon whom falls the *onus* of arbitrating on points of dispute or complaint between the public and the railways are experts or otherwise. Its neutrality and absence from political bias must be as unimpeachable as the law of the land.

Mr. Williams' book is a useful addition to the text-books upon the railway question which must be studied by all. C.L.E.

7.—Other New Publications.*

[These notes do not preclude a fuller review in a later issue of the *Journal*.]

Avenel (*Vicomte G. d'*). *La fortune privée à travers sept siècles*. 2^e édition. xiv + 411 pp., 8vo. Paris: Armand Colin, 1904.

[A *résumé* of a portion of the author's well-known "*Histoire économique de la propriété, salaires, &c.*" The results of the author's researches into the distribution of wealth in France over the period named are concisely given.]

Baring (*Hon. Francis Henry*). *Domesday tables for the counties of Surrey, Berkshire, Middlesex, Hertford, Buckingham and Bedford, and for the New Forest, with an appendix on the battle of Hastings. With some notes.* xvi + 239 pp., la. 8vo. London: St. Catherine Press, Ltd., 1909. Price 7s. 6d.

[An attempt to supply a want, especially in presenting the tables on a uniform plan. It is not, however, possible to carry out the plan in detail in each case.]

Blagg (*Helen M.*). *Statistical analysis of infant mortality and its causes in the United Kingdom.* viii + 44 pp., 8vo. London: P. S. King and Son, 1910. Price 1s.

[A study from the statistical point of view based largely on the reports of the Registrar-General and local medical officers of health. The direct and indirect causes of excessive infant mortality are considered, remedies are suggested, and conclusions are drawn—some of which are possibly open to controversy.]

Dawbarn (*C. Y. C.*). *Liberty and progress.* xvi + 339 pp., 8vo. London: Longmans and Co., 1909. Price 9s. net.

[This book is divided into three parts, the first dealing with the employed, the second with the principles of employment, and the third with the underpaid and unemployed. The author makes no new suggestions as to remedies for certain evils which he describes, but attempts to apply old principles to new conditions, and fairly and impartially to ascertain what those new conditions are which it is sought to modify or amend.]

* See also "Additions to the Library," pages 359, *sqq.*

Devine (Edward T.). Misery and its causes. xi + 274 pp., 8vo. New York: Macmillan and Co., 1909. Price 5s. net.

[This volume is based on a course of lectures delivered by the author at the School of Philanthropy, New York. They deal principally with the poor of that city, whose conditions of living the author has had special opportunities of studying. There are six chapters, in the last of which the main causes of poverty are recapitulated, and certain suggestions for the amelioration of these evils are put forward.]

Dodd (J. Theodore), M.A. The poor and their rights. 28 pp., 8vo. London: P. S. King and Son, 1910. Price 6d.

[The object of this pamphlet is briefly to show what are the rights of the poor, under the present poor law. Although reform of the law is necessary, many of the existing evils would be remedied or lessened if the law as it now stands were properly known and carried out.]

Dunlop (James C.), M.D. Occupation mortalities, with abstract of discussion thereon. (Transactions of Faculty of Actuaries, No. 45.) 86 pp., 8vo. London: C. and E. Layton, 1909. Price 2s.

[This paper is an elaboration and analysis of the last Decennial Supplement to the 65th Report of the Registrar-General of England and Wales, and it is owing to the excellent tabulation of the facts contained therein that the writer is able to deal further with them. The paper contains a brief account of previous statistical studies on the subject at home and abroad, to which might be added Dr. Thackrah's book on employment as affecting health, issued in 1831. The writer examines the probable sources of error which may arise in an inquiry of this kind, owing partly to the limited numbers of the population engaged, and partly to workers changing their occupations, or having more than one occupation. Suggestions are made for meeting these deficiencies.]

Ireson (Frank). The people's progress: a study of the facts of national wealth, with some answers to Socialists. viii + 159 pp., 8vo. London: John Murray, 1910. Price 2s. 6d.

[A discussion of the extent to which the artisan class has benefited by the progress of the nation during the last sixty years, and of the possible advantages of a Socialistic redistribution of our present national income. The author attempts to ascertain the proportion of income received by the manual labour class as compared with other classes, and to demonstrate the fallacies of Socialist writers on this subject. The book contains a number of tables and diagrams.]

Lee (Ivy L.). The American railway problem. 32 pp., 8vo. London: Stevens and Brown, 1910.

[A brief discussion of the question of American railways, regarded more especially as common carriers to the public. Reference is made to the great development of recent years, and to certain abuses that have arisen, particularly the freight rate rebates. A short account is given of the methods by which the State and Federal authorities seek to impose control.]

Stead (Francis Herbert). How old-age pensions began to be. vii + 328 pp., 8vo. London: Methuen and Co., 1910. Price 2s. 6d.

[An account of the efforts, individual and organised, to secure old-age pensions. The scheme of Mr. Charles Booth is described, and the Reports of the Royal Commission on the Aged Poor and of the Select Committees of the House of Commons on Old-Age Pensions are noticed, but there is no mention of the Report of the Select Committee of 1884-85 on National Provident Insurance. The book is somewhat loosely put together.]

Suret (Louis). Théorie de l'Impôt progressif. 774 pp., diagrams, 8vo. Paris: Felix Alcan, 1910. Price 15 francs.

[An exhaustive study of the theory of progressive taxation, as to which economists differ with varying degrees of intensity. The author examines the causes of these differences of opinion, and indicates in what directions further research should be pursued.]

Webb (Sidney and Beatrice). English poor law policy. xiii + 379 pp., 8vo. London: Longmans and Co., 1910. Price 7s. 6d.

[A comprehensive study and indictment of the present English poor law system. A correct appreciation of the present system is, in the opinion of the authors, impossible without some knowledge of the stages through which, in the past seventy-five years, it has gradually been moulded into its present form. These changes and developments are traced in the present volume.]

Whetham (W. C. D.), F.R.S. Eugenics and unemployment. 19 pp., 8vo. Cambridge: Bowes and Bowes, 1910. Price 1s. net.

[A brief study of the phenomena of heredity, and a consideration of the effect of certain tendencies of modern European civilisation on the future welfare of the race. The writer finds that the efficient classes of society are voluntarily restricting the number of their children, whereas the less fortunate class are multiplying rapidly, the action of natural selection being thus reversed. The probable consequences of this selective birth-rate upon the national problem of pauperism and unemployment are considered.]

Wicksteed (Philip H.). The common sense of political economy. xi + 702 pp., 8vo. London: Macmillan and Co., 1910. Price 14s. net.

[This volume is intended as a popular but systematic exposition of the "marginal" theory of economics. While making no claim to originality, the author endeavours to determine "what are the main applications of that theory inevitably demanded by the facts."]

CURRENT NOTES.

A further decline, to 3 per cent., has taken place in the Bank of England rate. The change was made on February 10, too late to be included in these notes last month. Inasmuch as, at that time, the Bank directors had evidently come to the conclusion that it was not advisable to compete for the weekly consignments of bar gold from South Africa, the decision was right. It is, as a rule, useless to keep the official minimum 1 per cent. or more above the open market rate unless the situation is such that it is intended to strengthen the reserve by taking measures to force the market to come up to the Bank's level. Since the reduction the Bank has lost a good deal of gold to France, Egypt and South America. The open market has recently hardened in consequence of this export drain, and is at present firm; but it remains to be seen if it will continue firm if the Bank competes for gold in the bullion market and thus strengthen its reserve. The difficulty is increased by the decision of the Government not to collect income tax; but the issue of long Treasury bills, in order to provide for the retirement of those which fall due this month, will tend to keep rates firm. Money appears likely to be easy, until income tax collection is resumed. In the meantime the big margin between bills and money is pleasing and profitable to the discount houses.

A heavy fall has occurred in silver, which dropped about $\frac{3}{8}$ on the announcement that the Indian Government has increased the import duty on the metal from 5 per cent. *ad val.* to 4*d.* per ounce, which at 24*d.* is equal to over 16 per cent. *ad val.* There has been a slight recovery since, and people in the silver market prefer to take short views at present.

The Stock Exchange has been quiet as a whole, owing to the uncertainties connected with home politics, but the speculative excitement in rubber shares has continued and their prices have advanced, the price of the commodity having moved up to an extent which has surprised even the most sanguine; over 10*s.* per lb. has been paid for fine Para. The market for the shares is not yet dangerous in the sense that the South African market was

dangerous in the summer of 1895, because few facilities for carrying over bargains have been given; but more continuous business is going on than a month ago; and it is also possible that rubber shares have been paid for by pledging other securities with banks. At any rate "the end is not yet," though prudent people are taking profits. There has also been a rapid increase in the volume of dealings in Rhodesian issues, many of which have risen considerably. Oil shares attracted attention for a time, but have become quiet again. New issues especially of rubber shares have been numerous. Consols have been weakened by the action of the Government in regard to the Sinking Fund, and by the prospect of large Treasury bill issues.

Mr. Sauerbeck's index number of prices for February is 78·1, the average of the eleven years 1867-77 being taken as 100. The index number continues to show an advance as compared with January, when it stood at 77·1, and December, when it stood at 76·3. While corn was rather cheaper, the prices of mutton, pork and sugar were distinctly higher, and butter remained very firm. Iron, copper and lead were barely maintained, but tin and house-coal advanced. Among textiles, there was a recovery in cotton, accompanied by firm rates for wool and flax. There was, however, a slight decline for jute, while sundry materials remained, on the whole, unchanged. The index number for food has risen from 73·8 in January to 75·5, or by 2·3 per cent., and there is a slight rise in materials, which are 79·9 as compared with 79·4 in January.

The trade returns for the month of February, which are summarised in the subjoined tables, show a continuation of the progress recorded last month. There is an increase both of imports and exports, the increase in the latter being due largely to manufactured articles. The imports of raw cotton, however, show a reduction in quantity of 1,752,452 cwt. (60·4 per cent.), and in value of 2,969,054*l.* (38·9 per cent.). As regards exports, cotton yarn declined in quantity by 1,331,000 lbs. (7·8 per cent.), but advanced in value by 104,456*l.* (11·4 per cent.), while cotton piece goods advanced in quantity by 33,841,800 yards (7·7 per cent.), and in value by 852,669*l.* (16·3 per cent.). It is noteworthy that of this amount India took more by 39½ million yards, while China took less by nearly 23 million yards. Woollen and worsted manufactures advanced by 740,648*l.*, silk manufactures by 24,642*l.*, and other textile manufactures by 138,074*l.*

Imports.	February, 1910.	Increase (+) or decrease (—) in February, 1910, compared with February, 1909.
Imports, value c.i.f. —	£	£
I. Food, drink and tobacco	18,395,471	+ 1,155,295
II. Raw materials and articles mainly unmanufactured	20,156,326	— 1,472,090
III. Articles wholly or mainly manufactured	12,339,298	+ 939,479
IV. Miscellaneous and unclassi- fied (including parcel post)	267,262	+ 67,530
Total merchandise	51,158,357	+ 690,214
Imports of bullion and specie	4,168,789	— 1,564,648

Exports.	February, 1910.	Increase (+) or decrease (—) in February, 1910, compared with February, 1909.
Exports, of produce and manu- factures of the United Kingdom, value f.o.b. —	£	£
I. Food, drink and tobacco	1,674,454	+ 158,703
II. Raw materials and articles mainly unmanufactured	3,879,297	+ 225,645
III. Articles wholly or mainly manufactured	25,667,243	+ 3,274,928
IV. Miscellaneous and unclassi- fied (including parcel post)	470,876	+ 8,142
Exports of foreign and colonial merchandise, value f.o.b. —		
I. Food, drink and tobacco	919,318	— 1,139
II. Raw materials and articles mainly unmanufactured	6,973,789	+ 1,639,761
III. Articles wholly or mainly manufactured	2,278,594	+ 63,994
IV. Miscellaneous and unclassi- fied (including parcel post)	12,859	+ 8,310
Total, British, foreign and colonial	41,876,430	+ 5,378,344
Exports of bullion and specie	5,781,955	+ 1,687,236

Shipping (foreign trade).	February, 1910.	Increase (+) or decrease (—) in February, 1910, as compared with February, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> with cargoes	2,726,721	— 60,570
Total, British and foreign, <i>cleared</i> with cargoes	3,938,039	— 178,808

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending February 26, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth-rates.	Mean Death-rates from all causes.
		Births.	Deaths.		
England and Wales (76 great towns).....	16,713,617	33,176	20,504	25·8	16·2
Scotland (8 principal towns).....	1,891,921	3,571	2,590	24·6	17·8
Ireland (Dublin registration area and 21 urban districts)	1,151,790	2,515	2,133	28·4	24·1

The English death-rate showed a marked decline in the course of the month, the weekly rates being given as 17·0, 16·6, 15·8 and 14·7 respectively. The mean rate is not so low as during January, when it stood at 15·2, but it compares favourably with the corresponding four weeks of 1909, when the mean rate was 18·3. The Irish death-rate ranged from 26·0 to 22·8, as compared with 23·0 to 20·7 last year. Otherwise, the various rates show no marked divergence.

The following returns relating to pauperism, from data supplied by the Local Government Boards in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for February, 1910:—

Selected urban districts.	Paupers on one day in the second week of January, 1910.				Increase (+) or decrease (–) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	81,575	42,984	124,559	259	– 3	– 12
West Ham	5,217	11,891	17,108	221	....	– 25
Other districts ...	76,132	125,242	201,374	214	....	– 3
Scotland	11,834	35,536	47,370	222	....	– 2
Ireland	15,916	12,663	28,579	235	+ 1	– 6
Total, January, } 1910	190,674	228,316	418,990	229	– 1	– 7

According to the Board of Trade *Labour Gazette*, the state of the labour market in January was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
January, 1910	416	694,456	47,259	6·8
December, 1909	416	692,153	45,963	6·6
January, 1909	416	688,558	59,786	8·7

Employment in January was, on the whole, not quite so good as in December. Shipbuilding and engineering continued to improve, but nearly all the textile trades showed some falling-off, especially cotton. There was also a seasonal decline in the building and printing trades. As compared with a year ago, however, all the principal industries, except cotton, showed an improvement. Returns from cotton firms employing 124,451 work-people in the week ended January 22 showed a decrease of 4 per cent. in the amount of wages paid as compared with a month ago, and of 15·7 per cent. as compared with a year ago.

The Census (Great Britain) Bill was read a first time in the House of Commons on March 4. Among the more important changes, as compared with the Act of 1900, it may be noted that a return is required, in the case of married persons, of the duration of the marriage, and the number of children born thereof, and also that the number of rooms inhabited must in all cases be stated. In the Act of 1900, it will be remembered, a statement of the number of rooms was required only when it was less than five. Both these requirements were recommended in the Report of the Census Committee of this Society (Report of Census Committee, A, Parts I and II). Clause 4 of the present Bill provides that the schedule shall contain the following particulars and no others:—

(a.) The name, sex, age, profession or occupation, condition as to marriage, relation to head of family, birthplace, and (in the case of a person born abroad) nationality, of every living person who abode in every house on the night of the census day; and

(b.) whether any person who so abode was blind, deaf, dumb, imbecile or lunatic; and

(c.) in the case of any person who so abode being married, the duration of marriage, and the number of children born of the marriage; and

(d.) the number of rooms inhabited; and

(e.) in the case of Wales or the county of Monmouth, whether any person who so abode (being of three years of age or upwards) speaks English only or Welsh only, or both English and Welsh.

The Enumerator is no longer required to copy the schedules, but simply to "complete such of the schedules as on delivery thereof appear to him to be defective, and correct such as he finds to be erroneous." In the Act of 1900 the Registrar-General was required to lay the Preliminary Report before the Houses of Parliament "within five months next after the census day, if Parliament be then sitting; or if Parliament be not then sitting, then within the first fourteen days of the session then next ensuing." This time limit has now been omitted, and each Report, both preliminary and detailed, is required to be presented "at as early a date as may be found practicable." There are several other changes of a minor character.

The Census Bill was considered at a meeting of the Census Committee of the Society on the 10th inst., and subsequently by the Council. The following letter was addressed to the Prime Minister, the Chancellor of the Exchequer, and the President of the Local Government Board:—

"SIR,

March 11, 1910.

"I have the honour to inform you that the Council of the Royal Statistical Society have had under consideration the Census (Great Britain) Bill, 1910, and they desire to express their hearty thanks to the Government for the adoption of several of the suggestions regarding the Census to which the Society attach much importance.

"The Council, however, instruct me to add that they exceedingly regret that provision is not made for a Quinquennial Enumeration of the simple character recommended by the Society on several occasions, and they venture to ask that the Census Bill may be extended to provide for such an enumeration in 1916.

"I have the honour to be, Sir,

"Your obedient servant,

(Signed)

"R. H. REW,

"Hon. Secretary."

In answer to a question subsequently put by Sir Charles Dilke, the President of the Local Government Board stated that he is well aware of the representations in favour of a quinquennial census made by the Royal Statistical Society and the Association of Medical Officers of Health, and that he is "not without hope that a system of quinquennial censuses may come to be adopted," although financial considerations have made it necessary to confine the present Census Bill to provision for next year's census only.

The Bill for taking the Census in Ireland has also been introduced. The scope of the information required and the machinery for conducting the Census are the same as in 1901. The enumerators are to take an account of the sex, age, religious profession, birth-place and occupation of each person, and also to take an account of the number of inhabited houses and of uninhabited houses and of houses then building, and of the number of rooms occupied by any occupier who is in occupation of less than five rooms.

A Committee of the British Association for the Advancement of Science has been formed to conduct an inquiry into "The amount and distribution of income (other than wages) below the income tax exemption limit in the United Kingdom." The Committee, of which Professor E. Cannan is Chairman and Mr. A. L. Bowley is Secretary, consists in addition of Professors F. Y. Edgeworth and H. B. Lees Smith, Dr. W. R. Scott, and Mr. W. G. S. Adams. The object of the inquiry is to ascertain the total of the national income and the relative number of persons in receipt of incomes of different amounts. In a circular which has been issued to employers it is stated that the total may be divided into three classes, (*a*) amount subject to income tax; (*b*) amount received as wages; (*c*) remainder. Fairly adequate information is extant for classes (*a*) and (*b*), but no serious inquiry, official or private, has been made in recent years as to (*c*), and this unknown amount is the subject of vague and misleading guesses. The work of the Committee is to form a reasoned estimate as to the numbers and income of persons, whose income from all sources is less than £160 and does not arise from wages. Apart from persons in receipt of pensions, annuities and dividends (as to whom the Income Tax Commissioners give some information), the class in question consists largely of clerks, teachers, shop assistants, &c. The Committee, having considered the practicable means of forming an estimate, is of opinion that the answers to the questions on the subjoined schedule, which is being issued to a number of companies and corporations, would be of material assistance to them in their task, when used in conjunction with the Population Census and other information. The returns will be used only for purposes of averages and will be regarded as strictly confidential; no name, whether of an individual or of a company, will be used in the report.

The following schedule has been issued, together with a similar schedule to be used where shop assistants are employed:—

Year and locality to which information applies _____

Nature of business or occupation _____

A. Number of partners, managers, clerks, &c., who draw more than 160*l.* per annum.

Men _____

Women _____

B. Number of partners, managers, clerks, &c., who draw 160*l.* or less. (Do not include (i.) workmen, *i.e.*, those in receipt of wages, or (ii.) clerks, &c., who do not give their full time to your business.)

Men and Lads _____

Women and Girls _____

As regards B.

Total Amount paid to these Clerks, &c. _____ £ _____

The above will give the essential information, but it is also important to fill in the following Table:—

Number of Clerks, &c. (under B), whose Incomes fall within the following limits:—

	Men and Lads.	Women and Girls.
140 <i>l.</i> to 160 <i>l.</i>		
120 <i>l.</i> „ 140 <i>l.</i>		
100 <i>l.</i> „ 120 <i>l.</i>		
80 <i>l.</i> „ 100 <i>l.</i>		
60 <i>l.</i> „ 80 <i>l.</i>		
40 <i>l.</i> „ 60 <i>l.</i>		
Under 40 <i>l.</i>		

A White Paper has been published showing with regard to each Parliamentary constituency in the United Kingdom the total number, and, as far as possible, the number in each class of electors on the register for the year 1910, and also showing the population and inhabited houses in each constituency. The following table summarises the information given:—

	England and Wales.	Scotland.	Ireland.	Grand total.
Population in 1901	32,527,843	4,472,103	4,458,775	41,458,721
Inhabited houses in 1901	6,260,852	926,914	858,158	8,045,924
<i>Electors for counties.</i>				
Owners	536,249	63,703	8,318	608,270
Occupiers	2,197,099	363,404	566,372	3,926,875
Lodgers.....	91,928	23,843	3,774	119,545
Total	3,625,276	450,950	578,464	4,654,690
<i>Electors for boroughs.</i>				
Occupiers	2,425,759	30,938	110,543	2,567,240
Lodgers	127,360	253,882	2,329	383,571
Freemen, freeholders, &c.	23,217	26,414	2,431	52,062
Total	2,576,336	311,234	115,303	3,002,873
University electors	20,110	23,024	5,020	48,154
Total for 1910	6,221,722	785,208	698,787	7,705,717
Total for 1909	6,154,719*	771,388	687,609	7,615,438

* Revised figures.

An article by Professor Verrijn Stuart on the "Development of Prosperity" in Holland has been reprinted in pamphlet form from the *Revue Economique Internationale*. After dealing with the problem of the summing of wealth, the writer discusses the indications of welfare in Holland. Tables are given showing a decrease in the mortality, and an increase in the height of the population. The rate of mortality has fallen from 26.56 per thousand in 1840-49 to 14.60 in 1907, and 15.02 in 1908 for both sexes. The decrease is rather more marked in the case of the female population. The progress of agriculture, industry and navigation, with the consequent increase in the national income, are briefly reviewed; and the raising of wages, as well as the distribution of wealth and of professional incomes for the last ten years, are considered. Although the economic and social condition of the nation appear on the whole to be satisfactory, Professor Verrijn Stuart does not disguise the existence of certain political and economic dangers. Thus, on the statistical side, he notes that infant mortality is still very high, since 12.63 per cent. of viable births did not survive one year in 1904-8; while in the provinces of Brabant and Limbourg the percentages were 18.0 and 17.30. Again, at the last Census, which was held at the end of 1899, the "recensement des habitations," taken for the first time, showed that about a quarter of the whole population lived in single rooms, while 42,594 dwellings (about 4 per cent. of the total) contained more than six persons per room. It was shown, further, that 41,877 of these dwellings consisted of only one apartment.

An interesting pamphlet by Dr. Julius J. Pikler has been reprinted by the Budapest Bureau of Communal Statistics, of which Dr. Pikler is the Vice-Director and Professor Gustav Thirring the Director. The subject of the essay is the "Budapest System" of dealing with the statistics of the causes of death, and its treatment is intended as a contribution to the question of international comparisons. The two abiding difficulties in the compilation of this branch of statistics are defined as, first, diversity in nomenclature, and, secondly, double or manifold causes of death; and the methods adopted by the Statistical Bureau of Budapest in dealing with these difficulties are fully treated. While the value of Bertillon's classification is admitted, there is much criticism as to its completeness. It is claimed that the "Budapest System" is unique in the precision of its classification and the certainty of its statistical results.

The Austrian Labour Department has issued a report on agreements respecting wages and hours of labour in 1907. There

were 784 such agreements concluded during the year, as against 478 in the preceding year: preliminary figures for 1908 show only 366 agreements. Of these 784 agreements, 477 concern single firms only, the remaining 307 affecting either a whole district or at least a group of firms, the two which affected the largest numbers of hands were those regarding the textile industry at Brünn (accepted by 46 firms with 12,238 hands) and the ladies' tailors, etc., of Vienna (700 firms employing some 9,000 hands, of whom about 8,000 were women). Both agreements included a minimum wage scale; the Brünn agreement stipulated for a 10-hour day, with shorter hours on Saturdays and holidays, and the Vienna agreement for a 9-9½-hour day. In the agreements concluded in 1906 a 9½-hour day was predominant, in the agreements of 1907 a 10-hour day, this being the number of hours specified in agreements affecting 41 per cent. of the firms and 40 per cent. of the hands who were parties to such agreements during the year. A 9-hour day was fixed by agreements affecting 19 per cent. of the hands and a 9½-hour day by agreements affecting 25 per cent. An abstract of all the collective agreements (district or group agreements) is given.

The *American Journal of Sociology* for January contains an article by Mr. Charles Richmond Henderson on "Improvements in Industrial Life Insurance." Mr. Henderson defines industrial insurance for his purpose as a system of weekly premium insurance, under which the agent solicits business, writes applications, collects premiums, takes proof of death, and pays claims at the house of the working man. After a detailed examination of the terms upon which a number of the leading insurance companies conduct their business, and the discussion of various improvements introduced by such firms as the Prudential Insurance Company and the Metropolitan Life Insurance Company, the article deals with the reasons for the reduction of cost in the industrial companies and with the motives of the companies. On the one hand, it is pointed out that nothing which has yet been done by the private companies weakens the argument for compulsory and socialised insurance; and, on the other, there are quotations claiming that the interests of the companies are so completely bound up with those of the working man as to render the introduction of a State system superfluous. Nevertheless, the great companies have projected such experiments as group insurance, "prophylactic measures," and insurance against accident, sickness and invalidism. A hint of what the most important companies are thinking was given in a circular of the Metropolitan Company early

in 1909, in which it was stated that while for the present the company would limit its activities to writing life insurance as before, it was hoped, "if there is any demand," and "if the feasibility can be demonstrated, to provide other forms of insurance, particularly "insurance against sickness, invalidism and old age."

An address by Mr. H. Lakin-Smith, F.S.S., which was delivered to the Birmingham and District Society of Chartered Secretaries last October, has now been published in pamphlet form. The writer discusses "Income tax assessments: what they are and should be," and urges that the only accurate and fair way would be that tax should be paid upon the profits of each previous year only, and that all losses, of however many years' standing, should be deductible from subsequent profits before tax becomes payable. In this way tax would be paid upon actual profits only.

Dr. Ignaz Gruber Ritter von Memminger, Deputy Representative of the Ministry of Finance at the Central Statistical Commission in Vienna, has been appointed Vice-Governor of the Austro-Hungarian Bank, with the title of *Gehheimrat*.

By the death of Professor Antonio Gabaglio, which occurred at Pavia on November 14, statistical science has lost a distinguished exponent. Professor Gabaglio was in his 69th year, and had been Professor of Statistics at the Royal University of Pavia for many years. His well known work on the "General Theory of Statistics" was first published in 1880, and was stated by Mr. Wynnard Hooper in his Paper on the "Methods of Statistical Analysis," in the Society's Journal for 1881, to be the best and most comprehensive work on statistics that had then appeared. One interesting feature of Professor Gabaglio's book was the careful collection of the opinions of the chief statistical writers on the nature of their subject. He had a very clear perception of the limits of statistical inquiry, especially in regard to sociology. A second edition of his "Theory of Statistics," in two volumes, was issued in 1888.

The death is announced of M. Maurice Bourguin at the age of 54. M. Bourguin, who occupied the chair of Political and Rural Economy at Lille and was professor in the Faculty of Law at Paris, began his academic career at Douai and was transferred later to Lille. Although his earlier work was not unknown to economists

it was not until 1895 that he attracted wider notice by a remarkable series of articles under the title "Mesure de la valeur et la monnaie," which he contributed to the *Revue d'Economie Politique*. This study was followed by a *brochure* in 1896 on "La Question monétaire et la baisse des prix," and by other short studies. In 1904 he published the first edition of his principal work "Les systèmes socialistes et l'évolution économique."

The death is announced, at the age of 61, of Dr. Franz Ritter von Juraschek, the President of the Imperial and Royal Central Statistical Commission of Austria-Hungary. Dr. von Juraschek was an Honorary Fellow of the Royal Statistical Society and a prominent member of the International Statistical Institute. A memoir will be published in the next issue of the *Journal*.

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Heft 2—Politik und Nationalökonomie. I: *Pohle (L.)*.

ITALY—

Giornale degli Economisti. November—December, 1909—La situazione del mercato monetario. Ancora la legge dei piccoli numeri: *Bortkiewicz (L.)*. Dilucidazioni sulla teoria dell'immiserimento: *Michels (R.)*. I principii distributivi delle imposte moderne sul reddito e sugli acquisti ed incrementi di capitali: *Griziotti (B.)*. Principii della teoria economica della moneta: *Iecchio (G. Del)*. Necrologio: Antonio Gabaglio.

Riforma Sociale. January—February, 1910—Gli inseriti nelle università e negli istituti superiori italiani nel sedicennio scolastico dal 1893-94 al 1908-09: *Ferraris (Carlo F.)*. Alle frontiere della scienza economica: *Jannaccone (P.)*. La vita industriale e finanziaria italiana dal 1904 al 1908: *Pargion (G.)*.

SWITZERLAND—

Journal de Statistique Suisse. Lief. 2, 1910—Das schweizerische Bankwesen in den Jahren 1906 bis 1908. Mouvement des Sociétés anonymes suisses pendant l'année 1908. Légitimation d'enfants naturels en Suisse pendant l'année 1907. Die internationalen Formularentwürfe für die Rechnungslegung der privaten Versicherungsunternehmungen: *Trefzer (F.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended March 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria-Hungary—

Bohemia. Finance. Direkte Steuern in Böhmen in 1901 und 1904 und Zuschläge zu denselben . . . im Jahre 1901. 8vo. 1909. (The Royal Statistical Bureau.)

France—

Education. Statistique de l'enseignement primaire. Tome 8^e, 1906-07. 4to. 1909. (The Ministry of Public Instruction.)

Germany—

Census. Berufs- und Betriebszählung, 1907. Berufsstatistik. Abteilung 7. Gemeinden mit weniger als 2,000 Einwohnern. 4to. 1910. (The Imperial Statistical Bureau.)

— Berufs- und Betriebszählung, 1907. Berufsstatistik. Abteilung 8. Kleinere Verwaltungsbezirke. 4to. 1910. (*Id.*)

— Berufs- und Betriebszählung, 1907. Gewerbliche Betriebsstatistik. Abteilung 3. Bundesstaaten. Heft 2. Das Hausgewerbe. 4to. 1910. (*Id.*)

Verein für Sozialpolitik—

Die Gemeindebetriebe in den Städten, Kreisen und Landgemeinden des Oberschlesischen Industriebezirks. Von *Dr. Heinrich Lückner*. Der Gemeindebetriebe zweiter Band. Zehnter Teil. Mit einer Karte des Oberschlesischen Industriebezirks. 8vo. 1910. (*Purchased.*)

Die Gemeindebetriebe der Stadt Halle a. S. Mit Beiträgen von *Dr. Georg Goldstein, Hugo Wasmuth* und *Paul Ochse*. Der Gemeindebetriebe zweiter Band. Achter Teil. Mit zwei Tafeln. 8vo. 1910. (*Id.*)

Die Gemeindebetriebe der Stadt Königsberg i. Pr. Von *Dr. Georg Neuhaus*. Der Gemeindebetriebe zweiter Band. Neunter Teil. Mit einem Stadtplan. 8vo. 1910. (*Id.*)

Die Gemeindebetriebe in Frankreich und England. Von *H. Berthélemy* und *Douglas Knoop*. Der Gemeindebetriebe dritter Band. Vierter Teil. 8vo. 1910. (*Id.*)

Gemeindefinanzen. Zweiter Band, erster Teil. Einzelfragen der Finanzpolitik der Gemeinden. Mit Beiträgen von *Otto Landsberg, Ernst Mischler, Walter Boldt, Alexander Polhmann* und *Theodor Kutzer*. 8vo. 1910. (*Id.*)

United States—

Library of Congress. Duplicate periodicals and serials available for exchange. January. 8vo. 1910. (The Librarian.)

— Publications issued since 1897. 2 parts, 8vo. January and March, 1909. (*Id.*)

— Want list of American historical serials. 2nd Edit., 8vo. 1909. (*Id.*)

— Want list of American 18th century newspapers. 8vo. 1909. (*Id.*)

— Want list of periodicals. New edition. 8vo. 1909. (*Id.*)

— Want list of publications of Societies. New edition. 8vo. 1909. (*Id.*)

California. Report on the labor laws and labor conditions of foreign countries, in relation to strikes and lockouts. 8vo. 1910. (California State Library.)

(c) United Kingdom and its several Divisions.

United Kingdom—

- Census of Production (1907). Preliminary tables . . . Part II, containing particulars relating to shipbuilding, &c. [Cd-5005.] 1910. (Purchased.)
- India. (Fifty years administration.) Memorandum on some of the results of Indian administration during the past fifty years of British rule in India. [Cd-1956.] 1909. (*Id.*)
- International Agricultural Institute. Copy of further papers and correspondence relative to the Institute. [Cd-1727.] 1909. (*Id.*)
- Municipal Trading (United Kingdom) Return. Part IV . . . (171—iii). 1909. (*Id.*)
- Poor. Royal Commission on Poor Law and Relief of Distress. Appendix, Vol. 6. Minutes of evidence, with appendix. [This vol. contains the oral and written evidence of witnesses from Scotland . . .] [Cd-4978.] 1910. (The Commission.)
- Appendix, Vol. 6A. Index to minutes of evidence. (Appendix, Vol. 6.) [Cd-4982.] 1910. (*Id.*)
- Probation of Offenders' Act, 1907. Report of Departmental Committee on the Probation of Offenders' Act, 1907. [Cd-5001.] 1909. (Purchased.)
- Sleeping Sickness. Report on measures adopted for suppression of sleeping sickness in Uganda. By Sir H. Hesketh Bell, K.C.M.G. [Cd-4990.] 8vo. 1909. (*Id.*)
- Trade. Royal Commission on Trade Relations between Canada and the West Indies. Minutes of evidence taken in Canada, and appendices. [Cd-4991.] 1910. (*Id.*)

England and Wales—

- London County Council. Report of Medical Examiner to the London County Council . . . on the work of the five years August, 1904, to July 31, 1909. Fol. 1909. (Purchased.)

(d) Authors, &c.

- Avenel (*Vicomte G. d'*). La fortune privée à travers sept siècles. 2^e édition. xiv + 411 pp., 8vo. Paris, 1904. (M. Armand Colin.)
- Baring (*Hon. Francis Henry*). Domesday tables for the counties of Surrey, Berkshire, Middlesex, Hertford, Buckingham and Bedford, and for the New Forest, with an appendix on the battle of Hastings. With some notes. La. 8vo. 1909. (Purchased.)
- Bartholomew (*J. G.*). A school economic atlas, with introduction by L. W. Lyde. 4to. Oxford, 1910. (The Oxford University Press.)
- Blagg (*Helen M.*). Statistical analysis of infant mortality and its causes in the United Kingdom. viii + 30 + 14 pp., 8vo. 1910. (Messrs. P. S. King and Son.)
- Bowley (*Arthur L.*). An elementary manual of statistics. vi + 215 pp., 8vo. 1910. (Messrs. Macdonald and Evans.)
- Chalmers (*George*). An estimate of the comparative strength of Great Britain . . . New edition, to which is annexed Gregory King's celebrated State of England. 8vo. 1802. (Mr. G. Udny Yule.)
- Chance (*Sir William, Bart.*). Poor law reform. Via tertia. The case for the Guardians. 95 pp., 8vo. 1910. (Messrs. P. S. King and Son.)
- Cook (*Laurey*). Illegitimacy. 15 pp., 8vo. 1910. (The Author.)
- Cornford (*L. Cope*). London Pride and London Shame. xiii + 171 pp., 8vo. 1910. (Messrs. P. S. King and Son.)
- Dawbarn (*C. V. C.*). Liberty and Progress. xvi + 339 pp., 8vo. 1909. (Messrs. Longmans.)
- Defoe (*Daniel*). A tour through the whole island of Great Britain . . . 5th edit. 4 vols., 12mo. 1753. (Mr. G. Udny Yule.)
- Derinc (*Edward T.*). Misery and its causes. (American Social Progress Series.) xi + 274 pp., 8vo. New York, 1909. (Messrs. Macmillan and Co.)
- Dodd (*J. Theodore*). The Poor and their rights. How to obtain them under existing legislation. 28 pp., 8vo. 1910. (Messrs. P. S. King and Son.)

(d) **Authors, &c.—Contd.**

- Dunlop (Dr. J. C.)*. Occupation Mortalities. With abstract of discussion thereon. (Transactions of the Faculty of Actuaries. Vol. 5, Part 1.) Svo. 1909. (The Author.)
- Haggard (F. T.)*. Pamphlets. [A collection of pamphlets dealing with trade, capital and labour, agriculture, naval efficiency, &c.] 1 vol., Svo. 1885-1907. (*Id.*)
- Lee (Jey L.)*. The American Railway Problem. An address delivered before the London School of Economics on 7th February, 1910. 32 pp., sm. Svo. 1910. (*Id.*)
- Pikler (Dr. Julius J.)*. Das Budapester System der Todesursachenstatistik. Ein Beitrag zur Frage der internationalen Vergleichbarkeit. 39 pp., Svo. Berlin, 1909. (Messrs. Puttkammer and Muhlbrecht.)
- Rozenraad (C.)*—
Table comparing the gold and silver stock of the principal banks of issue, their bank rate, the rate of exchange on London, and the price of the different Government Stocks of the various countries of Europe at the end of December, 1908, and December, 1909. Sheet fol. 1909. (The Compiler.)
Table comparing imports and exports of certain countries during 1909 and 1908. Sheet. 1910. (*Id.*)
- Schuurman (W. Elink)*. De Bedrijfsresultaten van de plaatselijk werkende Brandverzekering in 1908. 12 pp., Svo. 1910. (The Author.)
- Seligman (E. R. A.)*. The shifting and incidence of taxation. 3rd edition, revised and enlarged. xii + 427 pp., Svo. New York, 1910. (Messrs. Macmillan and Co.)
- Sella (Emanuele)*. La vita della ricchezza. 252 pp., Svo. Torino, 1910. (The Author.)
- Smith (H. B. Lees)*. India and the Tariff problem. vii + 120 pp., Svo. 1909. (Messrs. A. Constable and Co., Ltd.)
- Stead (Francis Herbert)*. How old-age pensions began to be. vii + 328 pp., portraits, Svo. 1910. (Messrs. Methuen and Co.)
- Stuart (C. A. Verryu)*. Le developpement de la prospérité dans les Pays-Bas. 31 pp., Svo. Bruxelles, 1910. (The Author.)
- Stuart (C. A. Verrijn) and Melhorst (H. W.)*. Verslag van het verhandelde op de 12^e bijeenkomst van het Internationale Statistische Instituut, gehouden te Parijs, 4-10 Juli 1909. 20 pp., Svo. 1909. (The Authors.)
- Sundbörg (Gustaf)*. Den Svenska och Europeiska Folkökningsoch Omflyttningssstatistiken i sina hufvuddrag. ix + 251 pp., Svo. Stockholm, 1910. (The Author.)
- Suret (Louis)*. Theorie de l'impôt progressif. 774 pp., diagrams, Svo. Paris, 1910. (Purchased.)
- Vögl (Dr. von)*. Die Sterblichkeit der Säuglinge in ihrem territorialen Verhalten in Württemberg, Bayern, und Oesterreich und die Wehrfähigkeit der Jugend. . . 74 pp. (with a cartogram illustrating the distribution of infantile mortality in the countries named), Svo. München, 1909. (*Id.*)
- Webb (Sidney and Beatrice)*. English Poor Law Policy. xiii + 379 pp., Svo. 1910. (Messrs. Longmans.)
- Whetham (W. C. D.)*. Eugenics and unemployment. . . 20 pp., Svo. Cambridge, 1910. (Messrs. Bowes and Bowes.)
- Whittall (W. J. H.)*. An Elementary Lecture on the Theory of Life Assurance. 2nd edition revised, to which are appended tables of selected compound interest values: and also four-figure tables of logarithms, anti-logarithms and reciprocals. 43 pp., Svo. 1909. (The Author.)
- Wicksteed (Philip H.)*. The common sense of political economy, including a study of the human basis of economic law. xi + 702 pp., Svo. 1910. (Messrs. Macmillan and Co.)

(e) **Societies, &c., British.**

- Royal Society. Reports to the Evolution Committee. Report V. Svo. 1909. (The Society.)
- Royal Society of Arts. Directory of the Society. Edited by Sir Henry Truman Wood, M.A. 76 pp., Svo. 1909. (*Id.*)

PERIODICAL RETURNS.

REGISTRATION OF THE UNITED KINGDOM.

No. I.—ENGLAND AND WALES.

MARRIAGES—To 30TH SEPTEMBER, 1909.

BIRTHS AND DEATHS—To 31ST DECEMBER, 1909.

A. —*Serial Table of MARRIAGES, BIRTHS, and DEATHS, returned in the Years 1909-1903, and in the QUARTERS of those Years.*

Calendar YEARS, 1909-1903:—Numbers.

Years	1909.	'08.	'07.	'06.	'05.	'04.	'03.
Marriages No.	—	264,940	276,421	270,038	260,742	257,856	261,103
Births	914,017	940,383	918,042	935,081	929,293	945,389	948,271
Deaths	517,782	520,456	524,221	531,281	520,031	549,784	514,628

QUARTERS of each Calendar Year, 1909-1903.

(I.) MARRIAGES:—*Numbers.*

<i>Qrs. ended last day of</i>	1909.	'08.	'07.	'06.	'05.	'04.	'03.
March..... No.	45,042	47,548	53,017	45,478	45,173	44,968	45,584
June	71,707	73,502	69,782	74,420	70,954	71,518	73,096
September ..	73,789	73,785	79,129	75,949	72,811	71,271	71,958
December ..	—	70,105	74,493	74,191	71,804	70,099	70,465

(II.) BIRTHS:—*Numbers.*

<i>Qrs. ended last day of</i>	1909.	'08.	'07.	'06.	'05.	'04.	'03.
March..... No.	229,074	240,112	229,287	237,427	237,826	240,513	234,959
June	237,142	243,834	238,535	237,168	236,702	238,634	241,511
September ..	228,619	237,229	230,528	234,663	235,352	237,666	241,595
December ..	219,182	219,208	219,692	225,823	219,413	228,576	230,206

(III.) DEATHS:—*Numbers.*

<i>Qrs. ended last day of</i>	1909.	'08.	'07.	'06.	'05.	'04.	'03.
March..... No.	160,657	156,328	160,020	140,451	148,291	153,347	138,201
June	125,021	121,052	127,337	125,370	123,078	124,245	123,661
September ..	104,741	113,929	106,813	129,397	120,882	133,694	116,740
December ..	127,363	129,147	130,051	136,063	127,780	138,498	136,026

*Annual Rates of MARRIAGES, BIRTHS, and DEATHS, per 1,000 PERSONS
LIVING in the Years 1909-1903, and in the QUARTERS of those Years.*

Calendar YEARS, 1909-1903 :—General Ratios.

YEARS.....	1909.	Mean 99-1908.	1908.	'07.	'06.	'05.	'04.	'03.
Estmd. Popln. of England and Wales in thousands in middle of each Year....	35,757,	—	35,349,	34,946,	34,547,	34,153,	33,763,	33,378,
Persons Mar- ried	—	15·7	14·9	15·8	15·6	15·3	15·2	15·6
Births	25·6	27·8	26·5	26·3	27·1	27·2	27·9	28·4
Deaths.....	14·5	16·1	14·7	15·0	15·4	15·2	16·2	15·4

QUARTERS of each Calendar Year, 1909-1903.

(I.) PERSONS MARRIED :—*Ratio per 1,000.*

<i>Qrs. ended last day of</i>	1909.	Mean 99-1908.	1908.	'07.	'06.	'05.	'04.	'03.
March	10·2	11·3	10·8	12·3	10·7	10·7	10·7	11·1
June.....	16·1	17·0	16·7	16·0	17·3	16·7	17·0	17·6
September	16·4	17·3	16·6	18·0	17·4	16·9	16·8	17·1
December	—	17·1	15·7	16·9	17·0	16·7	16·5	16·7

(II.) BIRTHS :—*Ratio per 1,000.*

<i>Qrs. ended last day of</i>	1909.	Mean 99-1908.	1908.	'07.	'06.	'05.	'04.	'03.
March	26·0	28·4	27·2	26·6	27·9	28·2	28·6	28·5
June.....	26·6	28·5	27·7	27·4	27·5	27·8	28·3	29·0
September	25·4	27·9	26·6	26·2	26·9	27·3	27·9	28·7
December	24·3	26·6	24·6	24·9	25·9	25·5	26·9	27·4

(III.) DEATHS :—*Ratio per 1,000.*

<i>Qrs. ended last day of</i>	1909.	Mean 99-1908.	1908.	'07.	'06.	'05.	'04.	'03.
March	18·2	18·4	17·7	18·6	16·5	17·6	18·2	16·8
June.....	14·0	15·3	13·7	14·6	14·6	14·5	14·8	14·9
September	11·6	15·0	12·8	12·1	14·9	14·0	15·7	13·9
December	14·1	16·0	14·5	14·8	15·6	14·8	16·3	16·2

B.—*Special Town Table*:—POPULATION ; BIRTH-RATE and DEATH-RATE in each Quarter of 1909, in the SEVENTY-SIX Large Towns.

Cities and Boroughs.	Estimated Population in the Middle of the Year 1909.	Annual Rate to 1,000 Living during the Thirteen Weeks ending							
		3rd April, 1909. (1st Quarter.)		3rd July, 1909. (2nd Quarter.)		2nd Oct., 1909. (3rd Quarter.)		1st Jan., 1910. (4th Quarter.)	
		Births.	Deaths.	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
Seventy-six towns	16,445,281	26·7	18·7	26·6	13·9	25·3	11·8	24·4	14·3
<i>Including—</i>									
London*	4,833,938	25·3	19·0	24·9	12·8	23·9	10·8	23·4	13·5
West Ham	321,767	28·2	18·1	28·7	13·2	26·0	11·8	26·1	13·1
Croydon	161,078	23·7	17·6	26·4	11·1	24·8	8·7	22·6	9·5
Brighton	130,926	19·7	20·8	21·6	13·3	20·9	11·6	19·8	15·4
Portsmouth	214,726	26·9	17·8	27·5	14·1	27·2	11·7	27·2	13·3
Plymouth	124,180	22·7	18·3	22·1	14·1	22·5	11·4	22·3	14·3
Bristol	377,642	22·5	15·5	23·5	12·4	22·6	10·6	21·7	12·4
Cardiff	195,303	27·1	15·8	26·3	12·7	25·6	11·4	24·2	12·6
Swansea	98,308	34·3	22·0	32·9	16·7	33·0	17·7	31·8	21·2
Wolverhampton	104,633	25·2	18·1	25·6	18·6	22·0	13·3	22·4	13·9
Birmingham	563,629	28·9	21·0	26·6	14·2	26·5	12·2	24·5	14·2
Norwich	124,136	24·6	16·4	26·4	14·1	23·2	12·4	22·9	12·6
Leicester	244,255	21·9	16·8	22·3	10·1	22·4	10·8	21·1	13·8
Nottingham	263,443	27·1	20·4	26·9	15·5	24·7	13·5	24·0	15·7
Derby	129,411	25·7	16·4	26·1	12·2	25·3	11·1	22·4	13·7
Birkenhead	121,123	32·9	17·5	31·5	15·6	30·7	13·0	28·5	17·7
Liverpool†	760,357	33·3	23·2	31·7	18·0	30·5	16·3	28·9	18·6
Bolton	187,824	26·8	18·4	24·6	14·0	25·2	12·8	22·4	15·2
Manchester	655,435	28·8	22·2	29·0	17·9	27·8	14·4	25·8	17·2
Salford	241,950	30·2	21·3	29·4	18·4	26·2	14·6	25·7	17·6
Oldham	143,301	29·2	22·1	29·1	19·7	27·3	14·9	23·9	19·6
Burnley	106,267	25·2	19·9	27·2	14·5	25·0	13·1	23·0	17·7
Blackburn	136,959	24·3	20·6	23·4	15·1	23·9	12·9	20·0	16·4
Preston	118,519	26·6	19·4	27·1	16·7	25·3	11·5	23·7	15·8
Huddersfield ...	94,739	23·4	19·3	26·5	14·7	25·6	13·9	22·6*	17·2
Halifax†	111,911	16·1	17·3	17·6	12·8	16·3	10·2	15·9	15·1
Bradford	293,983	18·5	19·2	20·4	13·9	18·2	10·9	18·0	14·0
Leeds	484,012	23·6	17·4	23·4	13·3	23·3	11·9	20·8	13·7
Sheffield	470,958	29·5	20·0	29·2	14·8	27·8	12·8	26·1	12·7
Hull	275,552	30·5	17·7	30·1	13·8	29·3	12·6	27·6	15·6
Sunderland	159,378	32·1	20·7	30·6	16·9	27·0	12·8	27·5	17·5
Gateshead	131,024	30·0	13·3	30·0	13·2	27·6	10·3	27·3	13·8
Newcastle-on- Tyne	281,584	28·2	16·9	28·4	15·1	27·2	12·9	25·5	11·4

* Including deaths of Londoners in the Metropolitan workhouses, hospitals, and lunatic asylums outside the County of London, but excluding deaths of non-Londoners in the London Fever Hospital, the Metropolitan Asylums Hospitals, and the Middlesex County Lunatic Asylum, within the County of London. The deaths in the other towns have been similarly corrected.

† As extended in 1902.

C.—Comparative Table of CONSOLS, PROVISIONS, COAL, and PAUPERISM in each
QUARTER of 1907-08-09.

Cols...	1	2	3	4	5	6	7					
	Average Prices of										PAUPERISM.	
Quarter ended	CONSOLS (for Money) per 100 <i>l.</i> Stock.*	Average Minimum Rate per Cent. of DISCOUNT Charged by the Bank of England.*	WHEAT per Quarter.†	Price per Pound at the Metropolitan Cattle Market (Sinking the Offal).‡						Average Price of Seaborne COAL per Ton in the London Market §	Average Number of PAUPERS Relieved on the <i>Last Day</i> of each Week.	
				Beef.			Mutton.				In-door.	Out-door.
				In- ferior Qual- ity.	Sec- ond Qual- ity.	First Qual- ity.	In- ferior Qual- ity.	Sec- ond Qual- ity.	First Qual- ity.			
1907	£ s. d.	£	s. d.	d.	d.	d.	d.	d.	d.	s. d.		
Mar. 31	86 9 3	5.18	26 5	4½	5½	7½	7	8½	9½	19 11||	265,450	540,392
June 30	84 18 2	4.19	29 0	4½	5½	7	6½	8	9¼	17 4||	246,345	518,579
Sept. 30	82 15 2	4.25	32 6	4½	5½	7½	6½	8	9¼	20 4	239,173	510,842
Dec. 31	82 10 8	6.09	34 8	3¾	5½	7	6½	8½	9½	20 3	258,449	519,604
1908												
Mar. 31	86 5 11	4.24	33 2	3¾	5½	6¾	6½	8½	9½	18 8	274,123	545,068
June 30	87 1 1	2.81	32 1	4½	5½	7½	5½	7½	8½	17 2||	259,533	525,118
Sept. 30	86 11 3	2.50	31 2	4	5½	7½	5½	7½	8½	16 11||	253,234	519,224
Dec. 31	84 6 6	2.50	31 8	4	5½	7½	5½	7½	8½	17 3||	273,455	541,619
1909												
Mar. 31	83 17 8	2.92	33 11	5½	6½	7½	4½	6½	8½	17 5||	287,621	558,524
June 30	84 16 11	2.50	41 1	4	6	7½	4½	6½	7½	16 4||	268,607	530,821
Sept. 30	84 0 6	2.50	40 3	3¾	6½	7½	4½	6½	7½	16 7||	260,344	518,042
Dec. 31	82 12 6	4.48	32 5	4	6	7½	4½	6½	7½	17 3||	278,216	522,530

* The prices of Consols and the Rate of Discount are furnished by the Chief Cashier of the Bank of England.

† As published by the Board of Agriculture.

‡ Furnished by the Board of Agriculture.

§ Furnished by the Mineral Statistics Department of the Home Office.

|| Sunderland coal only.

• Sunderland and Hartlepool coal only.

No. II.—SCOTLAND.

BIRTHS, DEATHS, AND MARRIAGES, IN THE YEAR

ENDED 31ST DECEMBER, 1909.

I.—*Serial Table :—Number of BIRTHS, DEATHS, and MARRIAGES in Scotland, and their Proportion to the Population estimated to the Middle of each Year, during each Quarter of the Years 1909-1905 inclusive.*

	1909.		1908.		1907.		1906.		1905.	
	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.
<i>1st Quarter—</i>										
Births	32,373	26·9	32,503	27·0	31,508	26·8	32,976	28·3	32,004	27·8
Deaths	21,469	17·9	23,997	20·0	22,635	19·2	20,488	17·6	20,820	18·1
Marriages ..	7,111	5·9	7,591	6·3	7,268	6·2	7,302	6·3	6,867	6·0
<i>2nd Quarter—</i>										
Births	34,671	28·5	35,611	29·6	34,511	29·0	34,960	29·7	35,476	30·4
Deaths	18,478	15·2	19,499	16·2	20,119	16·9	19,306	16·4	18,763	16·1
Marriages ..	8,171	6·7	8,813	7·3	8,864	7·4	8,699	7·4	8,153	7·0
<i>3rd Quarter—</i>										
Births	31,186	25·4	32,612	26·8	31,427	26·1	32,109	27·0	33,044	28·1
Deaths	14,964	12·2	16,325	13·4	15,721	13·1	16,439	13·8	16,412	13·9
Marriages ..	7,777	6·3	8,044	6·6	8,994	7·5	8,576	7·2	8,178	6·9
<i>4th Quarter—</i>										
Births	30,352	24·7	30,611	25·2	31,343	26·1	31,875	26·8	30,857	26·2
Deaths	19,683	16·0	18,018	14·8	18,792	15·6	19,352	16·3	18,531	15·7
Marriages ..	7,033	5·7	7,135	5·9	8,134	6·7	8,546	7·2	8,045	6·8
<i>Year—</i>										
Population .			4,826,587		4,776,063		4,726,070		4,676,603	
Births			131,337	27·2	128,789	27·0	131,920	27·9	131,381	28·1
Deaths			77,839	16·1	77,267	16·2	75,585	16·0	74,526	15·9
Marriages ..			31,583	6·5	33,260	7·0	33,123	7·0	31,243	6·7

II.—*Special Average Table:—Number of Births, Deaths, and Marriages in Scotland and in the Town and Country Districts for each Quarter of the Year ending 31st December, 1909, and their Proportion to the Population; also the Number of Illegitimate Births, and their Proportion to the Total Births.*

Registration Groups of Districts.	Total Births.		Deaths.		Marriages.	
	Number.	Per 1,000 of Population.	Number.	Per 1,000 of Population.	Number.	Per 1,000 of Population.
<i>1st Quarter—</i>						
SCOTLAND	32,373	26·9	21,468	17·9	7,111	5·9
Principal towns	14,891	26·8	10,274	18·5	3,498	6·3
Large „	4,466	29·6	2,820	18·7	953	6·8
Small „	6,817	28·3	4,012	16·6	1,440	6·0
Mainland rural.....	5,699	25·1	3,902	17·2	1,088	4·8
Insular „	500	18·2	460	16·8	132	4·8
<i>2nd Quarter—</i>						
SCOTLAND	34,671	28·5	18,478	15·2	8,171	6·7
Principal towns	15,663	27·9	8,679	15·5	4,292	7·6
Large „	4,940	32·4	2,410	15·8	1,071	7·0
Small „	7,406	30·4	3,523	14·5	1,526	6·3
Mainland rural.....	6,185	26·9	3,430	14·9	1,235	5·4
Insular „	477	17·2	436	15·7	47	1·7
<i>3rd Quarter—</i>						
SCOTLAND	31,186	25·4	14,964	12·2	7,777	6·3
Principal towns	13,945	24·6	6,842	12·0	4,414	7·8
Large „	4,364	28·3	1,979	12·8	1,018	6·6
Small „	6,688	27·1	2,979	12·1	1,379	5·6
Mainland rural.....	5,618	24·2	2,797	12·1	909	3·9
Insular „	571	20·3	367	13·1	57	2·0
<i>4th Quarter—</i>						
SCOTLAND	30,352	24·7	19,683	16·0	7,033	5·7
Principal towns	13,363	23·5	9,766	17·2	3,516	6·2
Large „	4,301	27·9	2,487	16·1	870	5·6
Small „	6,568	26·7	3,596	14·6	1,376	5·6
Mainland rural.....	5,532	23·9	3,451	14·9	1,171	5·1
Insular „	588	21·0	383	13·6	100	3·6

Population of Scotland.

Population.	Scotland.	Principal Towns.	Large Towns.	Small Towns.	Mainland Rural.	Insular Rural.
By Census of 1901.....	4,472,103	1,974,070	557,225	895,824	928,315	116,669
Estimated to the middle of 1909 }	4,877,648	2,254,968	612,521	978,273	920,481	111,405

No. III.—IRELAND.

IRELAND.—*Number of Births, Deaths and Marriages in each Province for each Quarter of 1909 and their Proportion to the Population.*

Provinces.	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.
<i>1st quarter—</i>						
Leinster	6,710	23·3	6,500	22·6	1,583	5·5
Munster	6,008	22·3	4,850	18·0	1,029	3·8
Ulster	9,577	24·2	7,924	20·0	2,260	5·7
Connaught	3,508	21·7	2,778	17·2	339	2·1
Ireland	25,803	23·6	22,052	20·2	5,211	4·8
<i>2nd quarter—</i>						
Leinster	7,317	25·4	5,532	19·2	1,530	5·3
Munster	6,313	23·5	4,380	16·3	2,189	8·1
Ulster	10,027	25·3	7,442	18·8	2,110	5·3
Connaught	3,337	20·6	2,373	14·7	965	6·0
Ireland	26,994	24·7	19,727	18·0	6,794	6·2
<i>3rd quarter—</i>						
Leinster	6,925	24·0	4,237	14·7	1,533	5·3
Munster	5,950	22·1	3,583	13·3	1,054	3·9
Ulster	9,190	23·2	5,525	14·0	2,142	5·4
Connaught	3,317	20·5	1,909	11·8	582	3·6
Ireland	25,382	23·2	15,254	14·0	5,311	4·9
<i>4th quarter—</i>						
Leinster	6,598	22·9	5,146	17·9	1,776	6·2
Munster	5,913	22·0	3,986	14·8	1,037	3·9
Ulster	8,924	22·6	6,811	17·2	2,260	5·7
Connaught	3,301	20·4	2,120	13·1	482	3·0
Ireland	24,736	22·6	18,063	16·5	5,555	5·1

* For the preceding quarter :—

Population of Ireland.

	Leinster.	Munster.	Ulster.	Connaught.	Ireland.
By census of 1901 ...	1,152,829	1,076,188	1,582,826	646,932	4,458,775
Estimated to middle } of 1909	—	—	—	—	—
	102,915	—	75,096	—	22,871
					—

IRELAND.

	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.
<i>1st quarter, 1909—</i>						
Total rural districts	15,977	20·5	14,399	18·5	—	—
Total urban districts	9,826	29·2	7,653	22·8	—	—
Dublin co. borough	2,467	—	2,241	—	552	—
Belfast co. borough	2,867	—	1,861	—	706	—
<i>2nd quarter—</i>						
Total rural districts	16,936	21·7	12,876	16·5	—	—
Total urban districts	10,058	29·9	6,851	20·4	—	—
Dublin co. borough	2,578	—	1,787	—	458	—
Belfast co. borough	2,883	—	1,909	—	594	—
<i>3rd quarter—</i>						
Total rural districts	15,882	20·4	9,768	12·5	—	—
Total urban districts	9,500	28·3	5,486	16·3	—	—
Dublin co. borough	2,467	—	2,241	—	552	—
Belfast co. borough	2,867	—	1,861	—	706	—
<i>4th quarter—</i>						
Total rural districts	15,619	20·1	11,506	14·8	—	—
Total urban districts	9,117	27·1	6,557	19·5	—	—
Dublin co. borough	2,277	—	1,721	—	656	—
Belfast co. borough	2,586	—	1,845	—	754	—

* Preceding quarter.

No. IV.—GREAT BRITAIN AND IRELAND.

SUMMARY of MARRIAGES, in the Year ended 30th September, 1909; and
of BIRTHS and DEATHS, in the Year ended 31st December, 1909.

(Compiled from the Quarterly Returns of the respective Registrars-General.)

Countries.	[000's omitted.]		Mar- riages.	Per 1,000 of popu- lation.	Births.	Per 1,000 of popu- lation.	Deaths.	Per 1,000 of popu- lation.
	Area in statute acres.	Popu- lation middle 1909, estimated.						
		No.	No.	Ratio.	No.	Ratio.	No.	Ratio.
England and Wales	37,327,	35,756,	260,643	7·3	914,017	25·5	517,782	14·5
Scotland	19,070,	4,878,	30,194	6·2	128,582	26·4	74,594	15·3
Ireland	20,228,	4,370,	22,871	5·2	102,915	23·6	75,096	17·2
Great Britain and Ireland }	76,625,	45,004,	313,708	6·9	1,145,514	25·5	667,472	14·8

*Values of Imports into the United Kingdom for the Years 1907-08-09.**

[From the Monthly Trade Returns, December, 1909.]

	Year ended 31st December,			Increase (+) or Decrease (-) in 1909 as Compared with 1908.	Increase (+) or Decrease (-) in 1909 as Compared with 1907.
	1907.	1908.	1909.		
I. FOOD, DRINK, AND TOBACCO -	£	£	£	£	£
A. Grain and flour	75,409,156	72,733,334	83,123,114	+ 10,389,780	+ 7,713,958
B. Meat, including animals for food	51,888,213	49,448,334	47,624,228	- 1,824,106	- 4,263,985
C. Other food and drink—					
(1.) Non-dutiable	67,460,229	68,576,894	67,850,958	- 725,936	+ 390,729
(2.) Dutiable	48,317,166	48,208,374	50,744,248	+ 2,535,874	+ 2,427,082
D. Tobacco	4,215,832	5,167,153	4,991,080	- 176,073	+ 775,248
Total, Class I.	247,290,596	244,134,089	254,333,628	+ 10,199,539	+ 7,043,032
II. RAW MATERIALS AND ARTICLES					
MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufac- tured fuel.....	20,845	4,689	8,482	+ 3,793	- 12,363
B. Iron ore, scrap iron, and steel	7,359,649	4,974,723	5,076,109	+ 101,386	- 2,283,540
C. Other metallic ores	10,128,132	8,901,105	8,327,144	- 573,961	- 1,800,988
D. Wood and timber	27,093,054	24,306,169	23,591,810	- 714,359	- 3,501,244
E. Cotton	70,458,197	55,834,833	60,295,201	+ 4,460,318	- 10,162,996
F. Wool	36,459,820	30,746,990	35,044,943	+ 4,297,953	- 1,414,877
G. Other textile materials	18,011,524	13,698,178	12,124,981	- 1,568,197	- 5,881,543
H. Oil seeds, nuts, oils, fats, and gums	30,697,416	28,514,967	31,043,087	+ 2,528,120	+ 345,671
I. Hides and undressed skins ...	10,752,733	9,422,965	11,618,180	+ 2,195,215	+ 865,447
J. Materials for paper making ...	4,363,297	4,610,997	4,499,247	- 111,750	+ 135,950
K. Miscellaneous	25,904,204	22,439,351	28,518,863	+ 6,078,512	+ 2,614,659
Total, Class II.	241,248,871	203,455,017	220,153,047	+ 16,698,030	- 21,095,824
III. ARTICLES WHOLLY OR MAINLY					
MANUFACTURED—					
A. Iron and steel and manufac- tures thereof	7,215,177	7,681,512	7,971,489	+ 289,977	+ 756,312
B. Other metals and manufac- tures thereof	28,932,812	24,659,602	24,346,326	- 313,276	- 4,586,486
C. Cutlery, hardware, imple- ments (except machine tools), and instruments ...	4,072,372	3,750,177	3,719,509	- 30,668	- 352,863
D. Electrical goods and appa- ratus (other than machinery and telegraph and tele- phone wire).....	1,247,650	1,263,762	1,321,709	+ 57,947	+ 74,059
E. Machinery	5,311,681	4,552,904	4,438,292	- 114,612	- 873,389
F. Ships (new)	27,015	18,199	23,926	+ 5,727	- 3,089
G. Manufactures of wood and timber (including furni- ture)	1,920,716	1,970,917	2,054,269	+ 83,352	+ 133,553
H. Yarns and textile fabrics—					
(1.) Cotton	9,871,076	9,475,795	9,837,871	+ 362,076	- 33,205
(2.) Wool	10,789,739	9,500,056	9,727,740	+ 227,684	- 1,061,999
(3.) Silk	13,572,049	12,536,224	12,759,935	+ 223,711	- 812,114
(4.) Other materials	7,168,975	6,402,863	7,324,931	+ 922,068	+ 155,956
I. Apparel	4,542,257	4,200,819	5,072,211	+ 871,392	+ 529,954
J. Chemicals, drugs, dyes, and colours	11,629,978	10,185,617	10,605,181	+ 419,564	- 1,024,797
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes).....	10,761,940	11,562,700	11,618,619	+ 55,919	+ 856,679
L. Earthenware and glass	4,052,434	3,685,330	3,757,504	+ 72,174	- 294,930
M. Paper	5,673,887	5,798,665	5,647,500	- 151,085	- 26,307
N. Miscellaneous	28,114,534	25,840,455	27,457,019	+ 1,616,564	- 657,515
Total, Class III.	154,904,292	143,085,597	147,684,111	+ 4,598,514	- 7,220,181
IV. MISCELLANEOUS AND UNCLAS- SIFIED (including parcel post)	£	£	£	£	£
.....	2,364,183	2,278,784	2,569,731	+ 290,947	+ 205,548
Total	645,807,942	592,953,487	624,740,517	+ 31,787,030	- 21,067,425

* The values of the imports represent the cost, insurance, and freight; or, when goods are consigned for sale, the latest sale value of such goods.

*Values of Exports of British and Irish Produce and Manufactures for the
Years 1907-08-09.**

[From the Monthly Trade Returns, December, 1909.]

	Year ended 31st December,			Increase (+) or Decrease (-) in 1909 as Compared with 1908.	Increase (+) or Decrease (-) in 1909 as Compared with 1907.
	1907.	1908.	1909.		
I. FOOD, DRINK, AND TOBACCO—	£	£	£	£	£
A. Grain and flour	3,089,163	3,522,912	3,399,936	- 122,976	+ 310,773
B. Meat, including animals for food	1,309,218	1,052,761	1,070,928	+ 18,227	- 238,290
C. Other food and drink	17,068,769	15,982,044	17,478,346	+ 1,516,302	+ 409,577
D. Tobacco	1,262,498	1,399,994	1,678,248	+ 278,254	+ 415,750
Total, Class I.	22,729,648	21,937,651	23,627,438	+ 1,689,807	+ 897,810
II. RAW MATERIALS AND ARTICLES MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufac- tured fuel	42,118,994	41,615,923	37,129,978	- 4,485,945	- 4,988,016
B. Iron ore, scrap iron, and steel	573,449	413,349	509,718	+ 96,369	- 63,731
C. Other metallic ores	189,685	71,777	95,575	+ 23,798	- 94,110
D. Wood and timber	111,841	98,218	108,395	+ 10,177	- 3,446
E. Cotton .....	...	...	...	...	...
F. Wool	3,207,904	2,662,151	4,259,619	+ 1,597,468	+ 1,051,715
G. Other textile materials	227,397	245,471	214,241	- 31,230	- 13,156
H. Oil seeds, nuts, oils, fats, and gums	3,429,748	3,091,825	3,399,697	+ 307,872	- 30,051
I. Hides and undressed skins	1,817,217	1,424,760	1,925,684	+ 500,924	+ 108,467
J. Materials for paper making	753,001	543,977	677,333	+ 133,356	- 75,668
K. Miscellaneous	2,573,845	2,215,048	2,462,539	+ 247,491	- 111,306
Total, Class II.	55,003,081	52,382,499	50,782,779	- 1,599,720	- 4,220,302
III. ARTICLES WHOLLY OR MAINLY MANUFACTURED—					
A. Iron and steel and manufac- tures thereof	46,563,386	37,406,028	38,267,690	+ 861,662	- 8,295,696
B. Other metals and manufac- tures thereof	11,674,131	8,856,472	8,725,048	- 131,424	- 2,949,083
C. Cutlery, hardware, imple- ments (except machine tools), and instruments	6,434,002	5,492,463	5,413,640	- 78,823	- 1,020,362
D. Electrical goods and appa- ratus (other than machinery, and telegraph and tele- phone wire)	2,469,927	1,943,104	2,240,586	+ 297,482	- 229,341
E. Machinery	31,743,253	30,999,516	28,088,956	- 2,910,560	- 3,654,297
F. Ships (new)	10,018,113	10,567,475	5,914,684	- 4,652,791	- 4,103,429
G. Manufactures of wood and timber (including furni- ture)	1,407,932	1,256,805	1,450,623	+ 193,818	+ 42,691
H. Yarns and textile fabrics— (1) Cotton	110,437,092	95,055,513	93,435,627	- 1,619,886	- 17,001,465
(2) Wool	34,158,857	28,391,922	30,922,366	+ 2,530,444	- 3,236,491
(3) Silks	2,410,949	1,635,622	1,860,172	+ 174,550	- 550,777
(4) Other materials	14,092,947	10,724,427	12,444,605	+ 1,720,178	- 1,648,342
I. Apparel	9,561,642	8,852,775	9,829,014	+ 976,239	+ 267,372
J. Chemicals, drugs, dyes, and colours	17,052,755	16,271,089	16,807,323	+ 536,234	- 245,432
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes)	4,559,037	3,826,258	4,246,150	+ 419,892	- 312,887
L. Earthenware and glass	4,048,893	3,700,037	3,689,277	- 10,760	- 359,616
M. Paper	2,344,230	2,314,967	2,558,125	+ 243,168	+ 213,905
N. Miscellaneous	33,048,127	29,610,943	31,409,916	+ 1,798,973	- 1,638,211
Total, Class III.	342,025,273	296,955,416	297,303,812	+ 348,396	- 44,721,461
IV. MISCELLANEOUS AND UNCLAS- SIFIED (including parcel post)	6,277,081	5,828,258	6,665,395	+ 837,137	+ 388,314
Total	426,035,083	377,103,824	378,379,444	+ 1,275,620	- 47,655,639

* The values of the exports represent the cost and the charges of delivering the goods on board the ship, and are known as the "free on board" values.

Trade of United Kingdom, 1909-1908-1907.—*Declared Real Value (Ex-duty) of Imports at Port of Entry, and therefore including Freight and Importer's Profit; and the Distribution of Exports of British and Irish Produce and Manufactures from the United Kingdom, according to their Declared Real Value.*

Merchandise (excluding Gold and Silver) Imported from, and Exported to, the following Foreign Countries, &c.	[000's omitted.]					
	1909.		1908.		1907.	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
	£	£	£	£	£	£
Russia { Northern ports..... }	37,970,	10,975,	20,395,	11,455,	21,003,	9,816,
{ Southern „ }			7,775,	1,058,	10,427,	1,162,
Sweden	9,725,	6,215,	10,353,	6,364,	11,065,	6,845,
Norway	6,473,	3,442,	6,508,	4,089,	6,613,	4,521,
Denmark*	18,768,	5,075,	19,477,	4,731,	18,263,	5,529,
Germany†	57,801,	32,306,	38,037,	33,374,	38,781,	41,377,
Holland.....	16,832,	11,732,	36,359,	11,547,	36,838,	13,949,
Java	1,978,	3,099,	985,	3,064,	1,107,	3,252,
Belgium†	17,655,	10,609,	27,153,	11,661,	28,284,	12,841,
France†.....	44,209,	21,469,	48,077,	22,403,	52,827,	23,640,
Portugal†	2,874,	2,288,	2,953,	2,436,	3,517,	2,693,
Spain†	13,435,	4,866,	13,345,	5,303,	16,847,	5,116,
Italy†	6,265,	12,147,	3,441,	15,034,	3,852,	14,132,
Austria-Hungary	8,088,	3,538,	1,304,	4,304,	1,089,	4,630,
Greece	1,553,	1,482,	1,913,	1,906,	1,979,	1,786,
Roumania.....	2,922,	1,718,	3,434,	2,003,	5,085,	2,108,
Turkey (European and Asiatic) and Crete	5,133,	7,612,	5,182,	6,977,	5,973,	7,525,
Egypt	19,867,	7,997,	17,593,	9,588,	22,225,	10,029,
Philippine Islands and Guam	1,464,	1,014,	1,676,	1,060,	2,099,	1,336,
China†	4,879,	8,445,	3,042,	9,217,	3,471,	12,035,
Japan§	3,701,	8,331,	2,926,	9,912,	3,242,	12,048,
United States { Atlantic..... }	118,356,	29,728,	124,175,	21,289,	131,131,	30,100,
{ Pacific					2,518,	810,
Peru	3,041,	1,339,	2,887,	1,382,	2,807,	1,932,
Chile	5,516,	4,627,	7,383,	3,956,	6,044,	7,348,
Brazil	11,290,	8,168,	6,939,	8,145,	9,733,	10,245,
Argentine Republic.....	32,732,	18,721,	35,751,	16,431,	26,478,	17,814,
Other countries	26,922,	23,877,	14,197,	22,787,	15,369,	24,177,
<i>Total—Foreign Countries.....</i>	<i>479,449,</i>	<i>251,120,</i>	<i>463,260,</i>	<i>251,481,</i>	<i>488,697,</i>	<i>288,846,</i>
BRITISH POSSESSIONS.						
Channel Isles	1,691,	1,252,	1,602,	1,283,	1,819,	1,193,
Nigerian Protectorate	2,292,	2,697,	2,109,	2,536,	1,955,	1,302,
Cape of Good Hope	7,693,	6,196,	6,105,	8,020,	7,270,	9,708,
British India, including Burmah	35,442,	43,631,	27,348,	44,797,	41,254,	48,500,
Straits Settlements (including Malay States)			2,277,	4,667,	2,701,	3,635,
Ceylon	5,556,	1,824,	5,135,	1,762,	5,231,	1,809,
Australia	32,649,	23,971,	29,079,	22,931,	33,871,	24,077,
New Zealand	17,731,	7,352,	14,665,	8,764,	17,783,	8,700,
Canada	25,229,	15,672,	26,287,	12,223,	28,035,	17,087,
British West Indies (including Bahamas)	2,163,	2,393,	2,143,	2,300,	1,988,	2,639,
Other Possessions	6,385,	18,593,	5,186,	13,071,	6,282,	14,821,
<i>Total—British Possessions</i>	<i>145,291,</i>	<i>127,259,</i>	<i>129,881,</i>	<i>125,739,</i>	<i>157,207,</i>	<i>137,359,</i>
<i>Total—Foreign Countries and British Possessions</i>	<i>624,740,</i>	<i>378,379,</i>	<i>593,141,</i>	<i>377,220,</i>	<i>645,904,</i>	<i>426,205,</i>

* Including Faroë Islands.

† Excluding Colonies.

‡ Excluding Hong Kong and Macão.

§ Including Formosa.

Trade of United Kingdom, for the Years 1909-1904.—Declared Value of the Total Exports of Foreign and Colonial Produce and Manufactures from the United Kingdom to each Foreign Country and British Possession.

Merchandise Exported to the following Foreign Countries, &c.	[000's omitted.]					
	1909.	1908.	1907.	1906.	1905.	1904.
	£	£	£	£	£	£
Russia { Northern ports }	7,383,	{ 7,345,	{ 7,312,	{ 6,659,	{ 6,248,	{ 6,705,
{ Southern „ }						
Sweden and Norway	1,314,	1,342,	{ 1,090,	{ 1,073,	{ 1,193,	{ 1,118,
Denmark*.....	531,	518,	{ 445,	{ 488,		
Germany†.....	14,920,	13,001,	629,	520,	483,	363,
Holland†.....	4,484,	4,291,	15,374,	14,753,	13,060,	11,325,
Java	24,	22,	5,039,	5,229,	4,845,	4,709,
Belgium	5,872,	5,413,	18,	16,	19,	103,
France†.....	9,645,	9,506,	648,	515,	4,755,	4,423,
Portugal†.....	455,	539,	10,001,	8,340,	7,091,	6,448,
Spain†.....	495,	502,	614,	654,	575,	607,
Italy†.....	1,133,	1,040,	786,	714,	599,	573,
Austria-Hungary.....	807,	758,	1,130,	1,317,	897,	851,
Greece	32,	41,	786,	815,	746,	674,
Roumania	32,	48,	57,	103,	81,	82,
Turkey (European and)	180,	201,	264,	327,	289,	240,
Asiatic) and Crete						
Egypt	160,	245,	48,	76,	67,	96,
Philippine Islands and Guam‡	28,	27,	209,	217,	212,	158,
China §	110,	75,	36,	36,	298,	119,
Japan || .....	267,	227,	109,	106,	162,	81,
United States	29,423,	21,177,	213,	208,	135,	154,
Peru	115,	144,	27,147,	25,475,	23,378,	19,075,
Chile	319,	223,	187,	109,	121,	141,
Brazil	306,	277,	409,	319,	321,	273,
Argentine Republic.....	499,	536,	304,	305,	296,	245,
Other countries	2,196,	1,741,	476,	485,	379,	727,
			2,061,	1,770,	1,627,	1,819,
<i>Total to Foreign Countries...</i>	80,730,	69,752,	81,845,	75,797,	68,544,	61,459,
BRITISH POSSESSIONS.						
Channel Islands	248,	239,	226,	226,	215,	216,
Nigerian Protectorates	222,	236,	174,	107,	115,	131,
Cape of Good Hope	677,	843,	882,	1,078,	986,	1,039,
Brit. India (including Burmah)	1,116,	1,416,	1,209,	1,229,	1,363,	903,
Straits Settlements (includ-)						
ing Malay States)	73,	78,	68,	68,	57,	54,
Ceylon	92,	91,	89,	92,	68,	55,
Australia	3,205,	2,720,	3,054,	2,552,	2,486,	2,505,
New Zealand	729,	746,	740,	652,	571,	582,
Canada	2,379,	1,967,	2,122,	1,788,	1,854,	1,624,
British West Indies (includ-)	367,	378,	373,	319,	302,	309,
ing Bahamas)						
Other Possessions	1,527,	1,197,	1,170,	1,195,	1,238,	1,428,
<i>Total to British Possessions</i>	10,635,	9,914,	10,127,	9,306,	9,255,	8,846,
<i>Total to British Possessions</i>	91,365,	79,666,	91,972,	85,103,	77,799,	70,304,
<i>and Foreign Countries }</i>						

* Including Faroë Islands, Iceland and Greenland.

† Excluding Colonies.

‡ Included Ladrone Islands before 1906.

§ Excluding Hong Kong, Weihaiwei and Macão.

|| Including Formosa.

SHIPPING.—(United Kingdom).—Account of Tonnage of Vessels Entered and Cleared with Cargoes, from and to Various Countries, during the Years ended Dec., 1909-08-07.

Countries from whence Entered and to which Cleared.	Total British and Foreign.					
	1909.		1908.		1907.	
	Entered.	Cleared.	Entered.	Cleared.	Entered.	Cleared.
FOREIGN COUNTRIES.						
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Russia { Northern ports	2,761,249	2,217,171	2,559,805	2,233,550	2,364,724	1,950,276
{ Southern „	780,550	135,895	610,028	185,766	833,041	256,856
{ Pacific „	104,118	15,280	2,077	5,007	1,506	2,045
Sweden	1,375,365	2,407,383	1,537,477	2,564,635	1,659,457	2,315,187
Norway	1,341,125	1,446,355	1,418,876	1,446,331	1,483,983	1,302,369
Denmark	551,028	2,050,775	533,424	1,994,807	515,010	1,971,543
Germany	2,217,633	6,102,655	2,276,524	6,058,765	2,237,990	6,452,876
Netherlands	2,804,213	3,308,173	2,702,447	3,150,396	2,676,470	3,913,871
Belgium	2,056,043	2,615,841	2,115,308	2,833,239	2,169,889	2,717,777
France	2,699,913	6,566,498	2,813,322	6,570,444	2,958,602	6,706,000
Spain	3,040,025	1,738,668	2,982,510	1,701,283	3,542,351	1,715,945
Portugal	287,295	687,921	264,155	654,804	247,705	673,319
Italy	383,758	4,714,634	362,255	4,605,768	321,297	4,470,759
Austria-Hungary	100,120	674,061	82,439	651,775	73,898	697,372
Greece	164,513	253,952	150,330	268,334	241,125	229,957
Turkey	213,701	367,606	217,317	406,585	242,948	386,527
Roumania	265,567	196,000	258,045	218,242	387,409	289,161
Egypt	385,950	1,482,766	386,566	1,407,375	421,615	1,574,892
Algeria	330,901	497,244	324,518	499,647	305,894	553,471
Portuguese East Africa	1,668,987	386,986	162,892	303,207	161,512	310,441
United States of America	6,684,733	5,190,531	7,238,519	5,282,665	7,317,814	5,836,877
Mexico, Foreign W. Indies, } and Central America	291,078	461,023	356,949	509,224	377,851	543,348
Colombia	76,287	42,831	16,220	44,916	16,588	67,308
Brazil	244,951	1,055,798	205,064	1,057,299	246,933	1,087,028
Peru	173,148	261,558	152,880	126,050	81,757	116,815
Chile	197,270	585,681	284,817	583,580	234,109	690,255
Uruguay	18,822	502,551	24,621	478,092	25,238	439,739
Argentine Republic	1,800,596	2,156,496	2,034,611	2,095,571	1,611,621	1,955,840
China	62,313	50,735	49,745	43,421	30,742	110,623
Java	110,900	253,927	75,502	217,128	86,606	203,103
Japan	567,618	652,305	448,003	608,952	396,863	616,812
Other countries	621,305	614,723	681,700	726,010	585,437	599,603
<i>Total, Foreign Countries.</i>	32,868,775	49,724,023	33,319,966	49,533,798	33,906,985	50,757,995
BRITISH POSSESSIONS.						
British North America	2,505,876	1,984,481	2,432,268	1,934,733	2,471,284	1,897,318
British India	1,747,584	1,710,157	1,471,714	1,519,167	2,036,490	1,547,217
Mauritius, Ceylon, Straits Settlements, & Hong Kong	51,739	314,668	65,808	322,084	70,661	388,226
Australia	1,104,237	953,770	954,763	829,340	956,315	796,966
New Zealand	387,099	409,331	325,455	416,458	361,305	384,312
West Indies	216,264	299,169	246,934	299,409	215,489	268,954
Channel Islands	430,879	333,449	436,024	323,206	438,738	325,383
Gibraltar and Malta	69,504	305,824	74,488	323,571	91,828	334,776
British South Africa	470,610	631,466	469,648	641,103	470,402	669,915
Other possessions	463,375	528,149	392,897	466,214	383,013	473,874
<i>Total, British Possessions</i>	7,447,167	7,470,462	6,869,999	7,075,885	7,495,525	7,086,941
TOTAL FOREIGN COUNTRIES AND BRITISH POSSESSIONS.						
Twelve Months { 1909	40,315,942	57,194,486	—	—	—	—
{ '08	—	—	40,189,965	56,609,083	—	—
{ December, '07	—	—	—	—	41,402,510	57,844,936

GOLD AND SILVER BULLION AND SPECIE.—(United Kingdom.)
—Declared Real Value of, IMPORTED AND EXPORTED, for the Years
1909-08-07.

[000's omitted.]

Countries.	1909.		1908.		1907.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Imported from—	£	£	£	£	£	£
Australasia	2,613,	34,	2,762,	35,	4,326,	71,
S. America, Brazil, } Mexico, W. Indies }	1,218,	207,	788,	43,	895,	256,
United States	2,956,	9,966,	118,	8,306,	654,	11,962,
	6,787,	10,207,	3,668,	8,384,	5,875,	12,289,
France	4,371,	502,	226,	391,	5,204,	382,
Germany, Holland, } and Belgium }	1,180,	391,	3,496,	453,	9,594,	532,
Portugal, Spain, } and Gibraltar }	139,	63,	409,	61,	213,	67,
Malta and Egypt.....	3,703,	21,	644,	32,	1,847,	29,
China, with Hong } Kong and Japan }	92,	37,	3,	—	50,	377,
West Coast of Africa	993,	45,	1,137,	173,	1,181,	30,
British Possessions } in South Africa }	32,957,	1,	31,814,	11,	29,444,	22,
British East Indies	2,171,	16,	2,408,	—	2,135,	295,
All other Countries	2,299,	532,	2,340,	822,	1,546,	1,961,
Totals Imported	54,692,	11,815,	46,145,	10,327,	57,089,	15,984,
Exported to—						
France	7,825,	422,	26,212,	730,	7,209,	1,521,
Germany, Holland, } Belg., and Sweden }	7,955,	1,400,	4,679,	665,	3,622,	396,
Russia	2,348,	1,028,	2,933,	365,	7,	102,
Portugal, Spain, } and Gibraltar }	102,	200,	85,	154,	54,	79,
Malta and Egypt.....	4,100,	72,	1,720,	94,	4,660,	320,
	22,330,	3,122,	35,629,	2,008,	15,552,	2,418,
B. India, China, } Hong Kong, and }	5,326,	8,841,	3,746,	9,647,	6,128,	11,697,
Japan						
United States	4,	5,	753,	201,	18,355,	1,
South Africa	127,	11,	20,	1,	130,	14,
S. America, Mexico, } W. Indies	11,272,	183,	6,759,	354,	7,686,	479,
All other Countries ...	8,190,	623,	3,062,	1,073,	3,015,	2,312,
Totals Exported	47,249,	12,785,	49,969,	13,284,	50,866,	16,921,
Excess of imports	7,443,	—	—	—	6,223,	—
„ exports	—	970,	—	—	—	937,

BANK OF ENGLAND.

Pursuant to the Act 7th and 8th Victoria, cap. 32 (1844),

[0,000's omitted.]

ISSUE DEPARTMENT.					COLLATERAL COLUMNS.	
1	2	3	4	5	6	7
Liabilities.	DATES. (Wednesdays.)	Assets.			Notes in Hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
Notes Issued.		Government Debt.	Other Securities.	Gold Coin and Bullion.		
£		£	£	£	£	Per cent.
Mlms.	1909.	Mlms.	Mlms.	Mlms.	Mlms.	
48,20	Jan. 6	11,02	7,43	29,75	29,63	3
48,70	" 13	11,02	7,43	30,25	29,09	
50,07	" 20	11,02	7,43	31,62	29,07	
51,17	" 27	11,02	7,43	32,72	28,65	
51,59	Feb. 3	11,02	7,43	33,14	29,13	
53,01	" 10	11,02	7,43	34,56	28,88	2½
53,82	" 17	11,02	7,43	35,37	28,50	
54,70	" 24	11,02	7,43	36,25	28,65	
54,99	Mar. 3	11,02	7,43	36,54	29,06	
55,95	" 10	11,02	7,43	37,50	28,67	
56,79	" 17	11,02	7,43	38,34	28,68	
57,80	" 24	11,02	7,43	39,35	28,68	
58,62	" 31	11,02	7,43	40,17	29,41	
56,36	April 7	11,02	7,43	37,91	30,01	
55,92	" 14	11,02	7,43	37,47	29,50	
56,33	" 21	11,02	7,43	37,88	29,08	3
56,40	" 28	11,02	7,43	37,95	28,98	
55,35	May 5	11,02	7,43	36,90	29,22	
54,99	" 12	11,02	7,43	36,54	29,15	
55,35	" 19	11,02	7,43	36,90	29,20	
54,99	" 26	11,02	7,43	36,54	29,37	
54,20	June 2	11,02	7,43	35,75	29,59	
55,19	" 9	11,02	7,43	36,74	29,40	
56,68	" 16	11,02	7,43	38,23	29,07	
57,71	" 23	11,02	7,43	39,26	29,38	
58,02	" 30	11,02	7,43	39,57	30,21	3 4 5
58,07	July 7	11,02	7,43	39,62	30,19	
57,87	" 14	11,02	7,43	39,42	29,91	
57,71	" 21	11,02	7,43	39,26	29,88	
56,18	" 28	11,02	7,43	37,73	29,85	
55,50	Aug. 4	11,02	7,43	37,05	30,21	
56,03	" 11	11,02	7,43	37,58	29,75	
56,97	" 18	11,02	7,43	38,52	29,46	
57,21	" 25	11,02	7,43	38,76	29,48	
57,15	Sept. 1	11,02	7,43	38,70	29,72	
57,30	" 8	11,02	7,43	38,85	29,34	4½
57,28	" 15	11,02	7,43	38,83	29,02	
56,49	" 22	11,02	7,43	38,04	28,97	
54,32	" 29	11,02	7,43	35,87	29,71	
51,92	Oct. 6	11,02	7,43	33,47	29,73	
50,92	" 13	11,02	7,43	32,47	29,32	3 4 5
50,05	" 20	11,02	7,43	31,60	29,04	
49,38	" 27	11,02	7,43	30,93	28,85	
49,28	Nov. 3	11,02	7,43	30,83	29,19	
50,39	" 10	11,02	7,43	31,94	28,81	
52,50	" 17	11,02	7,43	31,05	28,43	4½
53,69	" 24	11,02	7,43	35,24	28,49	
53,49	Dec. 1	11,02	7,43	25,04	28,96	
53,16	" 8	11,02	7,43	34,71	28,35	
51,81	" 15	11,02	7,43	33,36	28,31	
50,87	" 22	11,02	7,43	32,42	29,08	4½
50,29	" 29	11,02	7,43	31,84	28,86	

—WEEKLY RETURN.

for Wednesday in each Week, during the Year 1909.

[9,000's omitted.]

8	9	10	11	12	13	14	15	16	17	18
BANKING DEPARTMENT.										
Liabilities.					DATES. (Wednesdys.)	Assets.				Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.		Securities.		Reserve.		
Capital.	Rest.	Public.	Private.			Government.	Other.	Notes.	Gold and Silver Coin.	
£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.		£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.
14,55	3,34	7,55	47,82	,2	Jan. 6	17,59	35,20	18,57	1,42	72,78
14,55	3,37	5,66	42,88	,3	" 13	15,30	30,18	19,61	1,40	66,49
14,55	3,39	7,65	41,12	,5	" 20	14,80	29,52	21,01	1,44	66,76
14,55	3,40	6,84	43,17	,5	" 27	14,80	29,16	22,51	1,54	68,01
14,55	3,42	7,40	43,28	,2	Feb. 3	14,80	29,86	22,46	1,55	68,67
14,55	3,43	10,51	41,32	,3	" 10	14,80	29,26	24,13	1,66	69,84
14,55	3,45	12,06	41,16	,5	" 17	14,73	29,59	25,32	1,63	71,27
14,55	3,46	14,28	43,24	,5	" 24	14,70	33,20	26,05	1,63	75,58
14,55	3,69	15,79	40,71	,3	Mar. 3	15,14	32,02	25,93	1,68	74,77
14,55	3,69	17,27	39,88	,3	" 10	15,14	31,32	27,28	1,67	75,42
14,55	3,70	18,83	41,80	,4	" 17	15,11	33,55	28,10	1,63	78,43
14,55	3,75	20,04	42,53	,4	" 24	15,14	35,66	29,11	1,60	80,91
14,55	3,73	19,16	44,19	,3	" 31	15,31	35,60	29,21	1,54	81,66
14,55	3,13	14,25	44,82	,4	April 7	15,99	32,90	26,35	1,56	76,80
14,55	3,14	14,24	43,11	,5	" 14	15,99	31,18	26,12	1,51	75,10
14,55	3,16	12,73	45,13	,5	" 21	15,37	31,45	27,25	1,55	75,62
14,55	3,13	12,80	44,69	,4	" 28	15,37	30,88	27,43	1,53	75,21
14,55	3,14	11,93	43,93	,2	May 5	15,37	30,52	26,13	1,56	73,58
14,55	3,14	14,85	40,84	,3	" 12	15,37	30,62	25,83	1,58	73,40
14,55	3,14	14,95	40,99	,4	" 19	15,37	30,57	26,14	1,59	73,68
14,55	3,15	14,52	42,33	,4	" 26	15,37	32,01	25,61	1,61	74,60
14,55	3,09	13,46	43,87	,3	June 2	15,37	33,47	24,61	1,55	75,00
14,55	3,10	13,86	42,31	,2	" 9	15,37	31,11	25,79	1,57	73,85
14,55	3,10	12,97	44,76	,4	" 16	15,37	30,79	27,61	1,65	75,44
14,55	3,11	13,41	44,89	,5	" 23	15,37	30,71	28,33	1,60	76,01
14,55	3,10	12,31	58,49	,3	" 30	15,37	43,81	27,81	1,50	88,49
14,55	3,35	10,33	49,80	,2	July 7	16,87	31,82	27,88	1,49	78,05
14,55	3,36	8,38	48,13	,4	" 14	15,37	29,55	27,96	1,58	74,46
14,55	3,39	8,33	47,95	,3	" 21	15,37	29,58	27,83	1,49	74,26
14,55	3,40	8,52	45,74	,2	" 28	15,37	29,02	26,33	1,53	72,24
14,55	3,42	7,24	45,63	,2	Aug. 4	15,37	28,60	25,29	1,53	70,87
14,55	3,43	9,30	44,29	,2	" 11	15,37	28,40	26,28	1,56	71,60
14,55	3,45	10,22	44,81	,4	" 18	15,37	28,77	27,52	1,42	73,07
14,55	3,45	9,79	45,25	,3	" 25	15,37	28,46	27,74	1,51	73,07
14,55	3,67	8,86	46,47	,2	Sept. 1	15,33	29,33	27,44	1,49	73,58
14,55	3,68	8,06	47,82	,2	" 8	15,33	29,35	27,97	1,48	74,12
14,55	3,68	8,21	47,48	,4	" 15	15,33	28,90	28,26	1,48	73,97
14,55	3,69	9,00	45,71	,4	" 22	15,33	28,77	27,52	1,37	72,99
14,55	3,71	8,83	42,72	,3	" 29	15,23	28,64	24,61	1,37	69,85
14,55	3,10	7,00	45,26	,2	Oct. 6	17,71	28,58	22,19	1,45	69,93
14,55	3,11	5,57	46,44	,3	" 13	17,71	29,05	21,60	1,35	69,71
14,55	3,13	6,38	40,48	,5	" 20	16,79	25,48	21,01	1,31	64,60
14,55	3,14	7,12	40,82	,5	" 27	16,79	26,91	20,53	1,45	65,67
14,55	3,15	6,45	40,78	,2	Nov. 3	16,89	27,08	20,10	1,36	64,93
14,55	3,13	5,85	39,17	,2	" 10	16,16	23,73	21,58	1,26	62,73
14,55	3,14	6,32	40,23	,3	" 17	16,01	22,91	24,07	1,29	64,28
14,55	3,16	6,92	40,43	,4	" 24	14,41	24,18	25,20	1,31	65,10
14,55	3,10	5,32	40,69	,3	Dec. 1	14,41	23,50	24,52	1,26	63,69
14,55	3,11	7,19	38,65	,2	" 8	14,41	23,10	24,81	1,20	63,51
14,55	3,11	7,91	37,42	,4	" 15	14,41	23,97	23,50	1,15	63,04
14,55	3,12	9,77	40,99	,4	" 22	14,46	31,21	21,79	1,01	68,47
14,55	3,14	10,78	50,21	,2	" 29	14,71	41,77	21,43	,79	78,70

REVENUE OF THE UNITED KINGDOM.
Net Produce in Quarters in 1909, and in Financial Years ended
 31st March, 1908-09, 1907-08, 1906-07, 1905-06.
 [000's omitted.]

QUARTERS, ended	31st March, 1909.	30th June, 1909.	30th September, 1909.	31st December, 1909.	Total for Calendar Year 1909.
	£	£	£	£	£
Customs	7,531,	7,961,	6,846,	7,548,	29,886,
Excise	7,970,	6,822,	7,352,	9,696,	31,840,
Stamps and estate, &c., duties	7,050,	8,289,	7,064,	6,896,	29,299,
Taxes (Land Tax and House Duty) }	2,220,	320,	10,	40,	2,590,
Post Office	5,780,	3,300,	4,230,	4,790,	18,100,
Telephone Service	385,	390,	415,	455,	1,645,
Telegraph Service	665,	710,	935,	745,	3,055,
	31,601,	27,792,	26,852,	30,170,	116,415,
Property and In- come Tax	25,900,	3,286,	1,720,	2,224,	33,130,
	57,501,	31,078,	28,572,	32,394,	149,545,
Crown Lands	150,	100,	85,	165,	500,
Interest on Advances	522,	5,	646,	2,	1,175,
Miscellaneous	537,	512,	418,	319,	1,786,
<i>Totals</i>	58,710,	31,695,	29,721,	32,880,	153,006,

YEARS, ended 31st March,	1908-09.	1907-08.	1908-09.		Corresponding Years.	
			Less.	More.	1906-07.	1905-06.
	£	£	£	£	£	£
Customs	29,200,	32,490,	3,290,	—	33,115,	34,475,
Excise	33,650,	35,720,	2,070,	—	35,704,	30,239,
Stamps and estate, &c., duties	26,140,	27,040,	900,	—	27,034,	21,150,
Taxes (Land Tax and House Duty) }	2,630,	2,690,	60,	—	2,600,	2,670,
Post Office	17,770,	17,880,	110,	—	17,170,	16,880,
Telephone Service	1,510,	1,378	—	132,	—	—
Telegraph Service	3,020,	3,042,	22,	—	4,255,	4,130,
	113,920,	120,240,	6,452,	132,	119,878,	109,535,
Property and In- come Tax	33,930,	32,380,	—	1,550,	31,600,	31,350,
	147,850,	152,620,	6,452,	1,682,	151,478,	140,885,
Crown Lands	530,	520,	—	10,	520,	480,
Interest on Advances	1,171,	1,189,	18,	—	1,098,	1,099,
Miscellaneous	2,027,	2,209,	181,	—	1,940,	1,514,
<i>Totals</i>	151,578,	156,538,	6,651,	1,692,	155,036,	143,978,
			NET DECR. £4,959.			

Note.—The figures for 1907-08 have been adjusted to give effect to Section 17 (5) of "The Finance Act, 1907" (7 Edw. VII, c. 13), with respect to Local Taxation Grants, and the figures for 1906-07 have been similarly adjusted for the purpose of comparison.

FOREIGN EXCHANGES.—*Quotations as under, LONDON on Paris, Berlin, Calcutta;—and New York and Hong Kong, on LONDON, for 1909.*

1	2	3	4	4		5	6	7	8		9	
DATES. (Tuesdays or nearest Dates.)	London on Paris.	London on Berlin.	London on Vienna.	Calcutta.		Indian Council Bills. Minimum Price per Rupee.*	New York on London.	Hong Kong on London.	Price per Ounce.			
				London on Calcutta.	Demand.				Gold Bars (Fine).	Stand- ard Silver in Bars.		
3 m. d.	3 m. d.				60 d. s.†	t. t.						
1909.				s.	d.	s.	d.	\$	s.	d.	d.	
Jan. 5	25·10	20·60	24·23	1	3 $\frac{7}{8}$	1	3 $\frac{15}{16}$	4·85	1	9 $\frac{1}{16}$	77 10 $\frac{3}{4}$	23 $\frac{1}{4}$
„ 19	25·11 $\frac{1}{4}$	20·64	24·26	1	3 $\frac{9}{16}$	1	3 $\frac{15}{16}$	4·84 $\frac{3}{4}$	1	9 $\frac{1}{16}$	77 10 $\frac{3}{8}$	24 $\frac{3}{8}$
Feb. 2	25·16 $\frac{1}{4}$	20·63	24·24	1	3 $\frac{9}{16}$	1	3 $\frac{9}{16}$	4·85 $\frac{1}{8}$	1	9 $\frac{1}{8}$	77 9	24
„ 16	25·21 $\frac{1}{4}$	20·63	24·24	1	3 $\frac{7}{8}$	1	3 $\frac{15}{16}$	4·84 $\frac{7}{8}$	1	8 $\frac{7}{8}$	77 9	23 $\frac{3}{4}$
Mar. 2	25·22 $\frac{1}{2}$	20·64	24·24			1	3 $\frac{7}{8}$	4·85 $\frac{1}{2}$	1	8 $\frac{5}{8}$	77 9	23 $\frac{3}{8}$
„ 16	25·23 $\frac{3}{4}$	20·65	24·26			1	3 $\frac{9}{16}$	4·86 $\frac{1}{8}$	1	8 $\frac{3}{4}$	77 9	23 $\frac{5}{16}$
„ 30	25·18 $\frac{3}{4}$	20·59	24·25			1	3 $\frac{15}{16}$	4·85 $\frac{7}{8}$	1	8 $\frac{3}{4}$	77 9	23 $\frac{3}{16}$
Apl. 13	25·15	20·58	24·22			1	3 $\frac{15}{16}$	4·86 $\frac{1}{4}$	1	8 $\frac{7}{8}$	77 0 $\frac{1}{4}$	23 $\frac{9}{16}$
„ 27	25·15	20·57	24·21	1	3 $\frac{9}{16}$	1	3 $\frac{15}{16}$	4·86 $\frac{1}{8}$	1	9 $\frac{1}{4}$	77 9 $\frac{1}{4}$	23 $\frac{1}{16}$
May 11	25·15	20·58	24·20	1	3 $\frac{15}{16}$	1	3 $\frac{15}{16}$	4·86 $\frac{1}{4}$	1	9 $\frac{1}{2}$	77 9 $\frac{1}{2}$	24 $\frac{3}{8}$
„ 25	25·16 $\frac{1}{4}$	20·59	24·20	1	3 $\frac{9}{16}$	1	3 $\frac{15}{16}$	4·86 $\frac{1}{8}$	1	9 $\frac{3}{16}$	77 9	24 $\frac{3}{16}$
June 8	25·20	20·61	24·24	1	3 $\frac{15}{16}$	1	3 $\frac{15}{16}$	4·85 $\frac{3}{4}$	1	9 $\frac{3}{8}$	77 9	24 $\frac{3}{8}$
„ 22	25·20	20·61	24·24			1	3 $\frac{15}{16}$	4·86 $\frac{1}{2}$	1	9 $\frac{1}{4}$	77 9	24 $\frac{1}{16}$
July 6	25·17 $\frac{1}{2}$	20·58	24·22	1	3 $\frac{9}{16}$	1	3 $\frac{15}{16}$	4·86 $\frac{1}{2}$	1	8 $\frac{7}{8}$	77 9	23 $\frac{11}{16}$
„ 20	25·18 $\frac{3}{4}$	20·57	24·20	1	3 $\frac{7}{8}$	1	3 $\frac{15}{16}$	4·85 $\frac{3}{4}$	1	8 $\frac{13}{16}$	77 9	23 $\frac{3}{8}$
Aug. 3	25·18 $\frac{3}{4}$	20·57	24·22			1	3 $\frac{9}{16}$	4·85	1	8 $\frac{13}{16}$	77 9	23 $\frac{9}{16}$
„ 17	25·17 $\frac{1}{2}$	20·57	24·22			1	3 $\frac{9}{16}$	4·85	1	8 $\frac{3}{4}$	77 9	23 $\frac{9}{16}$
„ 31	25·16 $\frac{1}{4}$	20·56	24·23			1	3 $\frac{9}{16}$	4·85	1	9	77 9	23 $\frac{7}{8}$
Sept. 14	25·13 $\frac{3}{4}$	20·58	24·23	1	3 $\frac{7}{16}$	1	3 $\frac{15}{16}$	4·84 $\frac{7}{8}$	1	8 $\frac{7}{8}$	77 11 $\frac{5}{8}$	23 $\frac{11}{16}$
„ 28	25·13 $\frac{3}{4}$	20·60	24·22	1	3 $\frac{15}{16}$	1	4	4·84 $\frac{1}{8}$	1	9	77 11 $\frac{5}{8}$	23 $\frac{5}{8}$
Oct. 12	25·15	20·64	24·26	1	4	1	4 $\frac{1}{16}$	4·88 $\frac{5}{8}$	1	8 $\frac{7}{8}$	77 10	23 $\frac{11}{16}$
„ 26	25·20	20·71	24·36			1	4 $\frac{1}{32}$	4·83	1	8 $\frac{11}{16}$	77 9 $\frac{1}{4}$	23 $\frac{1}{4}$
Nov. 9	25·25	20·74	24·42	1	3 $\frac{31}{32}$	1	4 $\frac{23}{32}$	4·83	1	8 $\frac{3}{4}$	77 9	23 $\frac{3}{8}$
„ 23	25·18 $\frac{3}{4}$	20·70	24·38	1	4 $\frac{1}{16}$	1	4 $\frac{1}{8}$	4·83 $\frac{3}{4}$	1	8 $\frac{11}{16}$	77 9	23 $\frac{3}{8}$
Dec. 7	25·20	20·69	24·38	1	4 $\frac{1}{16}$	1	4 $\frac{3}{32}$	4·84 $\frac{1}{4}$	1	9 $\frac{3}{16}$	77 9	23 $\frac{11}{16}$
„ 21	25·21 $\frac{1}{4}$	20·71	24·39			1	4 $\frac{3}{32}$	4·84 $\frac{1}{4}$	1	9 $\frac{3}{8}$	77 9	24 $\frac{1}{4}$

* Wednesdays following.

† Fridays following.

JOURNAL
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NOTES *on the* FINANCIAL SYSTEM *of the* GERMAN EMPIRE.*By* WYNNARD HOOPER.

[Read before the Royal Statistical Society, March 15, 1910.]

AN exhaustive discussion on the financial system of the German Empire would fill a fairly large volume, and would probably interest few people out of Germany. In these notes an endeavour will be made to give an outline of the arrangements by which the finances of that great country are regulated without going into details, or figures, except where absolutely necessary. I think I am right in saying that until within the last six or seven years the German financial system has not attracted much attention in this country. The reasons why it has begun to attract attention are partly political, with which at this moment I have nothing to do, and partly connected with international finance; the German Empire has become a borrower to an extent seriously affecting the German money markets and consequently in some degree other money markets. The finances of the Berlin money market which, for many years past, has been one of the four important money markets of the world, are necessarily affected by the finances of the German Empire, as well as by those of Prussia. Financial trouble in Berlin causes trouble in London, Paris and New York.

The financial difficulties of the German Imperial Government are a consequence of the peculiar political constitution of the German Empire. At the risk of saying what many of those present know already, I must give some account of the political as well as the financial arrangements of the Empire. When in 1871 the princes of Germany acclaimed William, King of Prussia, as German Emperor at Versailles, the problem before them and their peoples was the building of a Constitution for the New Empire, the political heir of the ancient Deutsches Reich, the Holy Roman Empire. The Reich, for many years moribund, had definitely ceased to exist in 1806; but in 1815 the Deutscher Bund came into existence, in answer to the imperative need felt by Germans for a sign that "Germany" was

not a "mere geographical expression" as Italy was, and remained for many years afterwards. It is unnecessary to refer to the history of the Bund, which came to an end in 1866, when it flew to pieces amid the fierce battle between Austria and Prussia, by which Austria was thrust out of the Bund. On its ruins, after the Seven Weeks' War, Bismarck erected the Norddeutsche Bund or North German Confederation, a Confederation which did not include the South German States of the old Bund, but which had, as Louis Napoleon learnt to his cost, military treaties with them for definite objects bearing on the well-known designs of that remarkable exponent of French ambitions and hopes. When to Bismarck fell the task of creating a German Empire, whose credentials in the sight of Europe were the stricken fields of Gravelotte and Sedan, he had the model of the North German Confederation to work upon. His plans were necessarily conditioned by his materials, which were 22 sovereign kingdoms and principalities and three free towns, Hamburg, Bremen, and Lübeck. The new Empire included all Germany except the dominions of the House of Hapsburg, the South German States of Bavaria, Württemberg and Baden having joined their brethren of the North in the war against France.

Bismarck was committed by facts as well as by history to a Federal Constitution for the new Empire. The new Reich consisted of 25 independent political entities, but one among them, Prussia, supplied three-fifths of the population and a still greater proportion of the energy of the new Great Power. Accordingly, it was the King of Prussia who was created German Emperor at Versailles on January 18, 1871.

The machinery of the German Empire is, in appearance, simple. The Empire is governed by the Kaiser and his ministers, aided by the Reichsrath, or Council of the Empire, which is composed of 58 representatives of the various States and cities, of which 17 are Prussian, and by the Reichstag, a body elected by universal suffrage. The chief minister is the Chancellor of the Empire. Neither he nor any other of the ministers is a member of the Reichstag, but they have the right to appear in it in order to explain and justify the measures they propose, which cannot become law without being duly passed by the Reichstag. The members of the Reichstag are broadly divided into three great parties, the Conservatives, the Centre (representing the Roman Catholic voters) and the Social Democrats; there are also several minor groups, including the once influential National Liberals.

Finance.

When the Empire was first formed the question arose as to how it was to be furnished with money for its upkeep. It will be seen

at once that, as it was a purely political entity, it could possess no revenues except such as might be assigned to it by the free will of the States composing it. Each of them possessed revenues of its own, as a sovereign State, revenues which it needed for its own administration. There was then, and has been ever since, a fixed objection to granting direct taxes to the Empire. On the other hand, there were certain large revenues which could properly be regarded as Imperial :—

- (1) Customs (Zolle) ;
- (2) Excise (Verbrauchssteuer) ;
- (3) Stamp Duties (Stempelsteuer).

There was also the income from the Post and Telegraph Administrations of the various States, and from the railways of the so-called *Reichsland* (Alsace and Lorraine), and the income from the *Reichsinvalidenfonds*, a fund of about £28,000,000, originally constituted out of the War Indemnity exacted from France in 1871. These were the main sources of revenue assigned to the Imperial Government to enable it to perform its functions. This Imperial revenue was, however, subjected at an early stage in the history of the Empire to reductions, through “Assignments” (*Überweisungen*), by which part of the receipts from the Customs and other indirect taxation was assigned, or transferred back, to the individual States in proportion to their population. As early as 1879, when the Customs duties were much increased, the dislike of the States to making over revenue definitely to the Imperial Government was shown in the decision that the excess of the Customs receipts over a fixed sum should be assigned to the States. The results of this policy of restriction are clearly described by Dr. Schubart, an ex-official of the *Seehandlung*, whose handbook on the constitution and administration of the German Empire and the Prussian State I have found very useful. He says :—“As a consequence of this the matricular contributions rose steadily ; it is true that the assignments to the separate States also increased ; but whereas, at first, the assignments exceeded the matricular contributions, since 1898 the relation between the two has been reversed. The fluctuations in the receipts of the various States and the claims of the Empire produced oppressive uncertainty in the budgets of the States, and also made the Imperial Budget obscure.”

I do not propose to trouble the meeting with details of what is now ancient history, or with the figures of 30 or 40 years ago ; but it may be mentioned that the above items provided, as a rule, about three-fourths of the total Imperial revenue. Part of the balance required has been obtained from minor receipts and the remainder from the source, mentioned in the above quotation from Dr. Schubart, which

constitutes the chief cause of trouble in Germany's financial system, the matricular contributions (*Matrikularbeiträge*), or quotas annually supplied by the States towards the revenue of the Empire. These contributions, which are closely connected with the Assignments already referred to, are the root of Germany's financial troubles, so far as they result from the peculiar constitution of the German Empire, and not from the ever-increasing scale of the Imperial Government's expenditure.

The Imperial Budget.

The Imperial German Budget is divided into two sections, the Ordinary (*Ordentliche Etat*) and the Extraordinary Budget (*Ausserordentliche Etat*). The Ordinary section is divided into two parts, as regards both expenditure (*Ausgabe*) and income (*Einnahme*), namely, into recurring (*fortdauernde*) and non-recurring (*einmalige*) expenses and receipts.

THE IMPERIAL BUDGET.

Statement of the Outgoings (Ausgabe) and Receipts (Einnahme) of the German Imperial Government in the undermentioned years.

[From the *Statistisches Jahrbuch für das Deutsche Reich*, 1909.]

(In thousands of marks, 000's omitted.)

	Actual.				Estimates.	
	1904	1905	1906	1907	1908	1909
Outgoings.						
Ordinary :—						
Recurring	1,724,519,	1,792,012,	1,927,874,	2,073,676,	2,171,009,	2,221,703,
Non-recurring	167,767,	210,064,	229,479,	347,729,	354,510,	393,693,
Total ordinary	1,892,286,	2,002,076,	2,157,353,	2,421,405,	2,525,519,	2,615,396,
Extraordinary	175,761,	193,072,	235,146,	388,461,	265,551,	234,617,
Total ordinary and } extraordinary ... }	2,068,047.	2,195,148,	2,392,499,	2,809,866,	2,791,070,	2,850,013,
Receipts.						
Ordinary	1,868,212,	2,049,234,	2,111,867,	2,316,970,	2,525,519,	2,615,396,
Extraordinary :—						
Not from loans.....	37,470,	3,266,	6,368,	4,855,	4,597,	32,350,
From loans.....	99,499,	311,719,	258,377,	195,996,	260,954,	202,267,
Total extraordinary	136,969,	314,985,	264,745,	200,851,	265,551,	234,617,
Outgoings and Receipts.						
Total outgoings	2,068,047,	2,195,148,	2,392,499,	2,809,866,	2,791,070,	2,850,013,
Total receipts (not } including loans) }	1,905,682,	2,052,500,	2,118,235,	2,321,825,	2,530,116,	2,647,746,
Deficiency	162,365,	142,648,	274,264,	488,041,	260,954,	202,267,
Loans	99,499,	311,719,	258,377,	195,996,	260,954,	202,267,
Surplus	62,866,	199,071,	*15,887,	†292,045,	—	—

* Deficit ; met out of balance of previous year.

† Deficit ; met to the extent of 174,347,900 mks. out of balance of previous year. Net deficiency, 117,698,400 mks., was provided for in the Budget of 1908.

Statement of the principal items of the German Imperial Budget.

(In thousands of marks,—000's omitted.)

	Actual.				Estimates.	
	1904	1905	1906	1907	1903	1909
Outgoings.						
Ordinary :—						
Recurring (<i>fortdauernde</i>) :—						
Home Office	63,205,	71,200,	73,850,	75,923,	77,326,	77,999,
Army	578,328,	594,827,	632,610,	652,291,	670,532,	671,460,
Navy	99,871,	105,295,	115,357,	126,378,	133,801,	143,699,
Treasury*	213,970,	211,124,	231,553,	278,405,	308,483,	304,740,
Imperial debt	112,013,	119,588,	132,835,	147,432,	159,937,	171,453,
General pensions } fund	77,682,	79,892,	94,861,	101,170,	110,383,	115,110,
Invalids fund	51,991,	47,400,	37,972,	37,349,	36,039,	35,242,
Post and tele- } graphs	421,201,	453,345,	490,646,	524,081,	545,454,	568,054,
Imperial railways } Other	74,687,	80,572,	85,726,	96,047,	95,148,	93,654,
	27,171,	28,769,	32,461,	34,100,	33,876,	35,292,
Total	1,724,519,	1,792,012,	1,927,874,	2,073,676,	2,171,009,	2,221,703,
Non-recurring (<i>einmalige</i>) Total... }	167,767,	210,064,	229,479,	347,729,	351,510,	393,693,
Total ordinary ...	1,892,286,	2,002,076,	2,157,353,	2,421,405,	2,525,419,	2,615,396,
Extraordinary Total	175,761,	193,072,	235,146,	383,461,	265,551,	234,617,
Total ord. and } extraord. }	2,068,047,	2,195,148,	2,392,499,	2,809,866,	2,791,070,	2,850,013,
Receipts.						
Ordinary :—						
Customs (<i>Zölle</i>)... ..	469,862,	625,845,	557,046,	614,745,	666,974,	629,626,
Taxes and dues } (<i>Steuern und Gebühren</i>)	438,452,	429,410,	517,559,	561,690,	590,958,	573,652,
Post and telegraphs	487,771,	523,920,	564,697,	597,165,	644,147,	672,613,
Imperial railways ...	100,630,	109,011,	117,625,	121,537,	125,532,	123,291,
Matriculants	219,650,	213,250,	230,168,	226,618,	352,246,	411,260,
Other	131,847,	144,799,	124,774,	165,215,	145,662,	204,920,
Total ordinary	1,868,212,	2,049,235,	2,111,867,	2,316,970,	2,525,519,	2,615,397,
Extraordinary	136,969,	344,985,	264,745,	200,851,	265,551,	231,617,
Total Ord. and } extraord. }	2,005,181,	2,394,220,	2,376,612,	2,517,821,	2,791,070,	2,850,014,

* Including Assignments.

Matricular Contributions.

When the Empire was constituted the belief of its founders was that they had provided adequately for its financial needs; but it was foreseen that there would be years in which the probable receipts might fall short of the required total, and in order to enable the Chancellor to arrange his Budget beforehand with a balance on the right side it was provided that any deficiency should be made

up by federal contributions (*Matrikularbeiträge*) in proportion to the populations of the respective States. These contributions were to be temporary, and they were to be discharged out of accrued revenue as soon after the end of the financial year as the full accounts for it were completed. I should perhaps mention that the German Budget is not finally "closed" until many months after the period to which it refers is ended. For several years, as already mentioned, this programme was carried out, and, even after 1879, it was not recognised as being badly in need of amendment until about 1898, although the inconveniences attending it were becoming more and more painfully evident. It was not until 1904-06 that a serious attempt was made to put an end to the evil by granting certain new revenues to the Empire and providing that the assignments should be limited to receipts from spirits, the existing stamp duties and part of the new inheritance duty. The following table shows the magnitude to which both the Assignments and the Matriculars had risen by 1903-04, and indicates also the failure of the reform of 1904, and of the supplementary reform passed in 1906, to check the tendency of contributions to expand once more (in 000's of marks):—

Years.	Assignments.	Matricular Contributions.	Excess of Matricular Contributions over Assignments.
1901-02	555,710,000	570,930,000	15,220,000
'02-03	556,230,000	580,640,000	24,410,000
'03-04	541,540,000	565,856,000	24,316,000
'04-05	195,927,000	219,650,000	23,723,000
'05-06	189,059,000	213,250,000	24,191,000
'06-07	205,924,000	230,166,000	24,242,000
'07-08	195,042,000	226,618,000	31,576,000
'08-09	195,736,000	352,246,000	156,510,000
'09-10	195,178,000	411,260,000	216,082,000

N.B.—From 1901 to 1907, actual figures; for 1908 and 1909, estimated.

It is obvious that the state of things indicated in this table must have been intolerable to so precise and order-loving a nation as our German cousins. They have made during the last ten years no less than three attempts to place the finances of the Empire on a sound footing. They have not yet succeeded. Various causes have contributed to render their endeavours abortive, but one of the main roots of the difficulty is this question of federal contributions and assignments. Of course it may be said, with truth, that the real trouble is the same as that which is affecting other Governments—namely, the constant tendency to increase administrative expenditure. Governments do not say, and are not expected

to say, "We have so much money this year; in what way can we "arrange our finances so as to have a small surplus?" They say, "We have so much to provide for, and you, the taxpayers, must "find it for us. If you give us too much trouble, we shall borrow "such sums as are necessary." The Governments are not to blame for this attitude towards finance; they are forced into it by the demands of the representatives of the people in free countries, such as the United Kingdom and France, and by the influence of the governing classes in countries where, though some of the forms of popular Government are observed, popular control does not exist in reality. The result, however, may be much the same in both cases, in producing continually increasing expenditure. In the case of Germany we have of late years seen a constant increase of expenditure on the Army and Navy which is shown in the following table, at two-year intervals for the last seven years:—

[In thousands of marks—000's omitted.]

	1903.*	1905.*	1907.*	1909.†
Army:—				
Ord. recurring.....	575,838,	594,826,	652,291,	671,460,
„ non-recurring.....	50,455,	72,294,	111,915,	98,919,
Total, Ord.	626,293,	667,120,	764,206,	770,379,
Extraord.	33,675,	30,005,	44,050,	41,716,
Total, Ord. and Extraord.	659,968,	697,125,	808,256,	812,095,
Navy:—				
Ord. recurring.....	93,480,	105,295,	126,877,	143,699,
„ non-recurring.....	71,274,	79,212,	109,513,	146,505,
Total, Ord.	164,754,	184,507,	236,390,	290,204,
Extraord.	47,874,	46,976,	55,232,	109,787,
Total, Ord. and Extraord.	212,628,	231,483,	291,622,	399,991,
Total, Army and Navy	872,596,	928,608,	1,099,878,	1,212,080,
* Actual. † Estimated.				

Returning to the table of assignments and contributions, it may be noted that since May, 1904, when the assignments were much reduced, their total has been fairly steady at 200,000,000 marks. The matriculars, after their reduction in 1904, remained at from 213,000,000 to 230,000,000 until 1908, when they sprang up to 352,000,000; for 1909 they are 411,000,000. It will also be noted that since 1902 the excess of matriculars over assignments was about 24,000,000 until 1907, when it rose to 156,000,000; for 1909 (the current year) it is 216,000,000.

The matriculars have been a source of much vexation to the various States of the Empire. They have usually exceeded, when finally fixed, the estimates for them; they are levied per head of population, which is unfair to the poorer States, where the average wealth per head is less than in such rich places as Hamburg and Bremen. Since 1906 the States have been granted a delay of three years in which to pay their contributions when they exceed 40 pfennigs per head, or about 24,250,000 marks. Their complaints and remonstrances have, however, led to their being relieved even of this deferred responsibility, the amount of which has practically become a part of the floating debt of the Empire, though nominally it was a credit due to it. The "uncovered" matriculars of 1906 have been provided for in the Budget of 1909, and will thus be covered out of the proceeds of the loan which, as usual of late, is required to balance the Budget. On the other hand, it has been arranged that the limit of "uncovered" contributions shall be raised to 80 pfennigs per head. It remains to be seen whether the Empire's revenue will gain by this arrangement—whether, that is, this increase in the nominal burden on the States will become a reality.

The loans employed in balancing the Budget each year since 1903 have been as follows, according to the Estimates:—

Year.	Marks.	Year.	Marks.
1903-04	265,028,000	1907-08	195,996,000
'04-05	99,499,000	'08-09	230,954,000
'05-06	341,719,000	'09-10	202,267,000
'06-07	258,376,000		

The strenuous attempt made by Prince Bülow, in conjunction with Herr Sydow, the Minister of Finance, to reform the finances in 1908-9 broke down, owing to the opposition of various classes to their proposals. These proposals included new excise duties on beer, wine, and tobacco, taxes on gas and electricity, on advertisements, and an increased inheritance duty; besides an elaborate arrangement for buying up the whole spirit industry of Germany and constituting it a State monopoly, from which a considerable net income was anticipated. Most of these proposals were thrown out, or materially modified; every party objected to something in them. The most powerful opposition was from the Conservatives and the Centre (the Roman Catholic Party). These two parties hastily arrived at an agreement on July 8 last for a series of taxes calculated to produce about 470,000,000 marks (23,500,000*l.*) out of the 500,000,000 marks (25,000,000*l.*) which Prince Bülow had declared, with the concurrence of all good judges, to be indispensable if the Empire's finances were to be placed on a sound

footing. The new revenue producing measure now being tried involved increased levies on beer, spirits (the monopoly scheme was abandoned altogether), sparkling wine and tobacco; new taxes on matches and "lighting appliances" for gas and electricity, increased custom duties on tea and coffee, the retention of the duty on railway passenger tickets (which Prince Bülow had proposed to abolish) and additions to the stamp duties, including a new land transfer tax (*Grundstückstempel*), which it was estimated would produce 40,000,000 marks; for the year 1910-11, however, only about 25,000,000 marks are set down. Among the new imposts is a *Talonsteuer*, or tax on coupon sheets, which took the place of a proposal to tax Bourse transactions; it is estimated to produce about 27,000,000 marks, but seems likely to be less productive, at any rate at first, and to give trouble. These new taxes were adopted in a great hurry, and probably without sufficient examination—as is too often the case when political exigences have more weight than considerations as to the real merits of financial measures. It is impossible to say how they will turn out. They were adopted too late to produce their full effect in 1909-10, but the following statement of revenue derived purely from the new taxes up to December 31, 1909 (rather under six months of their operation) may be interesting. (From the official *Centralblatt*.)

	Marks.
Vinegar	253,000
Lighting apparatus.....	6,845,000
Matches	5,246,000
Talonsteuer	1,741,000
Checks	1,997,000
Land transfer	13,736,000

It is probable also that the newly-arranged spirit and beer duties have helped to produce the increases shown on the corresponding portion of 1908-9, amounting to 27,520,000 marks and 14,561,000 marks respectively in these items. Under the new law also the Empire has the full benefit of the Imperial Stamp duties, being no longer compelled to "assign" part of them to the States. The States have also conceded three-fourths instead of two-thirds of the Inheritance Duty (*Erbschaftssteuer*) to the Empire.

Nevertheless the finances of 1909, owing partly to supplementary estimates brought in in December, have necessitated the issue of a loan for 17,000,000*l.*, and another loan of about 9,500,000*l.* at least will be needed later. The effort to free the Imperial Government from borrowing has not so far succeeded. The States are no more ready than at any previous period to grant an income tax or other direct taxes to the Empire; the States are still of opinion that they need these revenues themselves. The most powerful parties in the

Reichstag are hostile to granting a material increase in the Death Duties, even though the States share the proceeds with the Empire; the attempt to provide the Empire with a solid revenue in the shape of a spirit monopoly was defeated, as already mentioned, although there is no reason to suppose that the distillers would have suffered when their plant was bought up. Several of the new taxes, especially those on matches, tea and coffee, must be an increased burden on the poorer classes, though they produce comparatively little.

The most serious question of all, however, has been left unsettled, namely, that of the matricular contributions, and consequently of the mode of dealing with deficits. It seems certain that these contributions will continue to be an important, probably an increasingly important, part of the Imperial revenue, and nevertheless it has not been found possible to devise a means whereby they can be assessed equitably in proportion to the wealth of the various States. As already mentioned, the "deferred contributions" for 1906 were not paid by the States when the three years' delay ended. They have been assumed as a liability by the Empire, and provided for by borrowing. At present there seems no escape from the continuance of this unsatisfactory state of affairs, unless the new revenues should produce much more than seems probable.

Note.—The funded debt of the German Empire has increased from 218,082,000 marks on March 31, 1880, to 1,118,000,000 marks in 1890, 2,298,518,000 marks in 1900, and 3,643,500,000 marks in 1908. (*Statistisches Jahrbuch*, 1909.)

DISCUSSION *on* MR. HOOPER'S PAPER.

MR. PERCY ASHLEY moved a cordial vote of thanks to Mr. Hooper for the interesting introduction he had given to an extremely difficult and at the same time peculiarly fascinating subject. He did not quite agree with Mr. Hooper in his opening remark that it was only within the last few years that the German imperial financial problem had attracted attention, though, no doubt, the reasons for the recent increase of such interest were largely political. The problem of German imperial finance was the same as that which confronted every federation; the same sort of difficulty had arisen in the United States and in the Australian Commonwealth, and it would probably be witnessed also in the new Federation of South Africa. As a humble student of history he might at the outset, although it was not germane to the paper, lodge his protest against the statement that the present German Empire might be regarded as the proper heir of the Holy Roman Empire; whatever

else it was, it was emphatically not that. The fundamental difficulty of German finance was political or constitutional. The assignment of the customs revenue to the federal government and the limitation of the federal government to "indirect" taxation was the common solution of the problem of federal finance; and running right through the history of the German Empire there had been a conflict between the federal government on the one side, desirous of obtaining revenues which should be entirely under its own control, and, on the other side, the State governments resolved not to allow such revenues to be obtained. At the outset there were certain assigned revenues, and any deficit was to be made up by contributions from the States. That being so, the governments of the States would have some control over the imperial policy; but, when the imperial needs grew, the customs duties were increased. Without entering into any controversy as to fiscal policy, it would be generally admitted that the tariff legislation of Germany in the late seventies was largely induced by the financial needs of the Empire. In view of the fact that the Empire was not altogether popular in, at any rate, some of the States, the central government dared not demand larger contributions which the States could furnish only by increases in their direct taxation. It would have been well if Mr. Hooper had explained a little more fully what happened. The customs revenue was increased; but, beyond a certain amount (6,500,000*l.*) all the yield of the customs had to be paid over to the States, and the matricular contributions went on. The result was that the Empire had to pay over huge sums on the one hand, and to receive back huge sums on the other. That was the key to the whole trouble. The plan answered well enough so long as the amount payable to the States from the customs exceeded the amount they had to pay to the Empire—that is to say, up to about 1898. During all that period of about twenty years, the States were getting more from the Empire than they paid to it; and consequently they acted on the assumption that such a state of things would continue, and that they would always get what was practically equivalent to grants-in-aid from the Empire. They adjusted their own financial systems accordingly; and even (as in the case of Prussia) handed over entirely to local authorities certain sources of revenue. Consequently, when at the end of the century the Empire found it could no longer go on giving these grants-in-aid not only did the States find an important source of revenue cut off, but at the same moment they had to find large additional amounts, and were confronted with the fact that certain revenues which were capable of expansion had been practically assigned to the local authorities. He regretted the omission from the Paper of any reference to systems of State taxation, since it did not appear to him possible to estimate the true position and the real problem of German imperial finance without taking into account the problems of State finance also. Further, one had to remember that the old belief still lingered in Germany that to allow the Empire any appreciable use of direct taxation would be to strike at the federal system and promote a centralisation which, in this instance, meant the still further

Prussianising of the Empire. He did not think it followed necessarily, but that was the contention. It was the southern States, Bavaria, Württemberg, Saxony and Baden especially, which were opposed to Prussianisation, and therefore were inclined to resist so strongly any intrusion of the Empire on the sphere of direct taxation. Mr. Hooper had spoken of "our German cousins" being order-loving. For his own part he was bound to say that, having had occasion to devote some attention to the financial accounts of the German Empire, he had failed to discover any such love of order. The accounts were, no doubt, accurate so far as they went, and one could make certain deductions from them, but sometimes one could not make one page agree with another, and there were many points on which they were quite extraordinarily obscure. As regards financial administration, quite apart from the complication of the matricular contributions and the assignments, and other cross accounts, he would point out that, until about 1889-90, there had been no distinction in the German accounts, and no theory even as to the distinction which ought to be made between extraordinary and ordinary expenditure, that is, expenditure which could properly be met out of loans and expenditure which ought to be met out of revenue. Similarly, until 1906, there had been no provision whatever for the redemption of debt. In 1906 they did make provision, but it had not yet been carried into effect. So that for thirty years they had the Empire piling up debt without making any provision for redemption; and when such provision had been prescribed by law the financial situation was such that the law could not be carried out. Mr. Hooper had referred briefly to the debt of the German Empire. It was interesting to observe that it had more than doubled since 1896. In that year the permanent debt was 106 millions, in 1908 it was 212 millions, and it was now about 240 millions—and that increase was during fourteen years of peace. It was true that a certain amount, about one-fourth, was incurred for the war in China and the rising in South Africa; but practically the whole of the expenditure out of loans, more than doubling as it did the Imperial debt, had taken place during a time of peace without any arrangement for redemption, and was almost entirely for unremunerative purposes. The total debt of the Empire and States was about 900 millions. But against their share the States had very large assets—railways, mines, forests, &c.; while, in the case of the Imperial debt, there were none, except the railways of the *Reichsland*. He feared that some of his remarks had sounded rather critical of the Paper; they were not, however, so intended. He would thank Mr. Hooper again for his very interesting introduction to a very difficult subject, and would venture only to express his regret that the author had not carried his survey somewhat further.

Mr. ROSENBAUM, in seconding the vote of thanks, said that he could echo Mr. Ashley's criticism about the character of the German finance accounts, to which he had frequently had occasion to refer. He had often enough discovered inconsistencies between different volumes, and even between different pages of the same volume.

There were things which one would expect to discover in any properly kept books of account, but which one utterly failed to find. For example, they did not show anywhere how much was spent on the cost of collecting the customs in Germany. The difficulties with regard to German finance which had been brought to their attention so closely within the last few years by the misinterpretation of the huge deficits in the annual budgets were due to the peculiarly wooden and inelastic system of finance followed in Germany. Practically none of the main sources of revenue were elastic in the sense that one could increase or decrease them year by year. That was a very great difficulty, especially as no check whatever existed on the ability of the Imperial Government to increase the expenditure each year. The real difficulty in Germany was the constitution. That was due, first, to the fact that the Imperial Government had not the power to command the sovereign States to contribute to the finance of each year, and, secondly, to the fact that the German Empire had no income tax and no death duties—no such items as could be increased each year if necessary. Their main source of revenue was the customs, and that was generally and necessarily a fixed amount, even although no portion of it was handed over to the States, in the sense that the rates of tariff were generally fixed for a period of years by customs treaties with various countries. Consequently, all the sources of revenue available to the Government were of such a character that it was impossible to increase or diminish them. The deficit which arose each year had to be provided by loan; while the squaring of the accounts was a subject of negotiation, compromise and concession between the Imperial Government and the various States. If they could imagine the Government of Great Britain having to govern without the income tax and without death duties, and depending entirely on customs duties fixed by international treaties, they would have some conception of the enormous difficulties that would confront our own Chancellor of the Exchequer in trying to balance his accounts each year. But that was really the condition of financial affairs in Germany. The complexities of the German accounts were not, perhaps, so fully indicated as they might have been in the Paper, and he thought the author had treated them rather too tenderly. Thus, he had not taken into account an item like the beer duties in the *Brausteuerverein*. When he (Mr. Rosenbaum) read a Paper before the Society, two years ago, he found extraordinary difficulty in trying to collect together in a comparative form the taxes raised in Germany corresponding to similar taxes raised by the Government of this country, and that had led him to examine rather closely the German finance accounts; and, although he had not looked at them as closely since, he had a vivid recollection of their extraordinary complexity.

Mr. FLUX said he entirely agreed with what had been said as to the extreme complexity of the German finance accounts. Any effort to get clear and consistent results out of them almost brought one to a state of despair, and he thought Mr. Hooper had been somewhat daring in undertaking to present to the Society in

a simple form a subject of so much complexity. Going through the table on p. 385, which showed the principal sources from which the German Empire derived its funds, one thing which would strike the English student was that the classification to which he was accustomed in the separation of the duties on commodities—from stamp duties, for example—had not been followed in the arrangement of the receipts. If it were not improper, he would like to suggest that the item of taxes and duties should be divided, and the yield of excise duties shown separately from the stamp duties and the duties on inheritances, which were commonly called direct taxes by English students, though not so classified by German writers. The amounts under those heads were not large in proportion to the total, but it would be interesting to know how much was taxation on commodities and how much on other things. Another point which illustrated the complexity of the German accounts was the item “posts and telegraphs.” The postal systems of the Empire were not unified, and, consequently, the revenue stated under this head was only that part of the gross postal revenue which was under the administration of the Imperial Government, the assignments from those States which controlled their own postal revenue being included under another head. In reference to the gross totals of revenue and expenditure, seeing that the matricular contributions and assignments were payments to and from between the States and the Empire, one was tempted to suggest that a more rational presentment would show the net amount of Imperial revenue after deduction of the assignments from the matricular contributions. That arrangement would yield a total of the Imperial revenue and expenditure more nearly comparable to the tables they were used to in other countries. Mr. Hooper, of course, could not attempt to present such figures, which would be totally different from those set out in the German official reports. He was merely commenting on the involved manner in which the German accounts presented results. At the bottom of the same page he got a little puzzled with the explanation offered; it appeared to suggest that in some way or other the Imperial Chancellor could balance his Budget by bringing into it a sum the greater part of which he knew he would have to pay back, as soon as the accounts were closed, out of the revenue accruing in the year. He would like to ask if, in the table showing the excesses of matricular payments over assignments, any part of the large excesses of the last two years was due to deferred contributions, as some of the German accounts which he had seen included such amounts.

· Mr. HOOPER said they were not included.

Mr. FLUX said the only other point to which he would refer was one mentioned by Mr. Hooper at the end of the Paper. It threatened to become an important one unless the procedure of adding to the funded debt the unpaid contributions of the States were repeated. If real payments by the States to the Empire were to increase in anything like the way indicated by the end of the table, it became a matter of considerable importance and interest to

know what was the nature of the resources from which the States obtained their revenues, and out of which they would have to meet any such balances as were there suggested. Mr. Ashley had made some interesting suggestions, which seemed to lead to the conclusion that any inquiry of that nature would bring them into a very complicated field of finance. It was difficult to say from what particular State revenues the net matricular contributions were derived, but it would be of considerable interest if the relation of State finance to Imperial finance could be presented to them on some future occasion.

Mr. HOOPER, after thanking the members for the kind way in which the Paper had been received, said that he was fully conscious of its weak points; but, as Mr. Flux had pointed out, to deal with the subject more minutely would have taken up a great deal more than one evening. The dependence of the Empire on contributions from the various States, which they were exceedingly unwilling to give, seemed to him to be the key to the whole position, unless indeed the Imperial Government were prepared to keep down their expenditure. As they had been increasing that expenditure by the amount of 4 or 5 millions sterling per annum for some time, they were bound to get involved in difficulties unless they could get fresh revenue. With reference to the inheritance duty, his idea had been the same as those already expressed, namely, that it was a direct tax. But when he consulted the authorities in Germany they contended it was indirect, and stated that if it was direct the States would not allow the Empire to have it at all. As it was, the States insisted on having part of it. They began by having one-third, but they had now agreed to be content with taking only one-fourth. When Prince Bülow and Herr Sydow proposed a measure by which the State would get what really would be a substantial revenue from the death duties of over 4 millions, it was unanimously turned out of the Reichstag as being a cruel and iniquitous thing. The question of the net revenue from posts and telegraphs was very much like our own: the net revenue in this country was not much more than about 3 millions, while the German net revenue was something like 4 or 5 millions sterling. They did just as we did. They set the gross receipts on one side, and put the administrative expenses on the other; and the difference came to about 100 million marks. The administrative expenses for the current year were 568 million marks; and the gross revenue was 672 million marks. Of course there were some other items which were of a similar character—for instance, the revenue obtained from the railways in Alsace and Lorraine. They got about 6 to 6½ million sterling in revenue and they spent about 5 millions; which gave a net return of about 1 to 1½ millions. But when the imperial authorities looked at the Prussian and other State railway systems they looked at them with longing eyes; they would much like to have the results of the present system handed over to the imperial finance. But that was not the view taken by Prussia or by Württemberg, Bavaria or Saxony.

*THE INCREASED YIELD per ACRE of WHEAT in ENGLAND
CONSIDERED in RELATION to the REDUCTION of the AREA.*

By H. D. VIGOR, B.Sc.

[Read before the Royal Statistical Society, March 15, 1910.]

THE aim of the present note is to investigate the change in the yield of the wheat crop during the period from 1885 onwards, for which official returns of the production per acre in England are available and to trace whether some of the increase shown in the returns may or may not be due simply to the withdrawal of less productive soils from the crop.

The fluctuations in the average wheat yield per acre from 1885 to 1908 are shown in the following diagram :—

Wheat acreage and yield per acre in England, 1885-1908.



In addition to the yields of each year I have drawn the average yield of the first and last decades, respectively, of the period as horizontal lines. The acreage under wheat is drawn in the lower half of the diagram, with the corresponding decennial averages.

For the decade 1885-94 the average yield of wheat in England was 29·35 bushels, and for the period 1899-1908, 31·39 bushels per acre. The increase was 2·04 bushels, or 6·9 per cent.

The average area for 1885-94 was 2,162,000 acres, and for 1899-1908 1,614,000 acres. The reduction was thus 548,000 acres, or 25·3 per cent.

The increased yield may, of course, be the result of a large number of influences other than the withdrawal from wheat of the less productive soils. Among such influences may be mentioned more favourable weather, increased and more scientific manuring, the introduction of heavier cropping varieties of wheat and improved drainage. Some of these factors would clearly take a much longer period to produce an appreciable effect than others. The important connection between the climatic conditions and the yield of the crops was the subject of the paper on the "Correlation of the Weather and the Crops," read before the Society in January, 1907, by Mr. R. H. Hooker. The author came to the conclusion, as regards the increased yield per acre of wheat in the East of England in the twenty years 1886-1905, that the more favourable weather conditions, particularly the diminished autumn rainfall, were, in themselves, sufficient to account for the material increase of the wheat yield (from 30·4 to 32·1 bushels per acre) in the counties considered.¹ Mr. Hooker also stated that his investigations gave no evidence in support of a theory that the considerable reductions in the areas under certain crops during the previous twenty years might, apart from other factors, have resulted in improved yields.²

It has seemed to me that this question was one which admitted of further examination by direct analysis of the changes which have occurred in the yield and the total acreage of wheat in each county, comparing the figures of the earliest decade for which returns are available with those of the latest decade. All the data used are contained, or may be calculated from figures published, in the annual *Agricultural Statistics of Great Britain*.

Table 1 contains the average yield per acre and the average total area of wheat in each English county (except London) in each decade. It also shows the ratio of the earlier to the later yield, and the earlier to the later area. These ratios will hereafter be referred to as the yield ratio and acreage ratio respectively. The counties are arranged in the local groups in which they appear in the agricultural statistics.

¹ *Journal of the Royal Statistical Society*, vol. lxx, 1907, p. 24.

² *Ibid*, p. 26.

TABLE I.—*Yields and areas in each county of England in the decades 1885-90 and 1899-1908, with the yield and acreage ratios.*

Divisions and counties.	Average yield per acre.			Average acreage.		
	1885-94.	1899-1908.	Ratio.	1885-94.	1899-1908.	Ratio.
<i>East—</i>	bushels.	bushels.		acres.	acres.	
Bedford	28.82	30.56	1.060	42,413	35,576	.839
Huntingdon	29.21	29.77	1.019	35,958	31,108	.865
Cambridge	32.99	32.55	.986	105,585	91,827	.870
Suffolk	29.05	30.54	1.051	121,714	99,722	.819
Essex	30.71	31.94	1.040	139,938	108,485	.775
Hertford	28.36	30.57	1.078	54,676	49,502	.905
Middlesex	30.02	33.45	1.114	4,819	2,626	.506
<i>North-East—</i>						
Norfolk	31.36	32.62	1.040	157,223	117,724	.749
Lincoln	32.46	33.94	1.046	218,231	167,249	.765
York, F.R.	29.88	31.16	1.043	68,239	62,683	.919
<i>South-East—</i>						
Kent	32.12	35.17	1.095	67,832	42,441	.626
Surrey	27.44	30.09	1.097	28,333	17,346	.614
Sussex	30.58	33.49	1.095	71,402	47,908	.671
Berkshire	28.06	29.82	1.063	45,061	34,681	.770
Hampshire	26.71	29.50	1.104	76,740	54,824	.714
<i>East Midland—</i>						
Nottingham	28.72	28.84	1.004	46,931	36,192	.771
Leicester	31.00	29.63	.956	26,294	21,497	.818
Rutland	30.50	31.82	1.043	6,098	4,780	.784
Northampton	31.16	32.74	1.051	53,417	42,590	.797
Buckingham	27.43	29.79	1.084	42,425	31,490	.742
Oxford	27.98	30.42	1.087	44,109	34,468	.781
Warwick	29.08	30.28	1.041	43,741	31,881	.729
<i>West Midland—</i>						
Salop	29.59	30.34	1.025	47,704	27,468	.576
Worcester	28.52	30.36	1.065	41,417	27,497	.664
Gloucester	27.82	29.82	1.072	61,101	42,758	.700
Wiltshire	29.13	32.22	1.106	63,329	49,702	.749
Monmouth	24.46	25.34	1.036	9,775	4,225	.432
Hereford	26.72	30.10	1.126	35,306	21,575	.611
<i>South-West—</i>						
Somerset	28.14	30.33	1.078	43,273	29,300	.677
Dorset	28.49	31.83	1.117	28,219	20,121	.713
Devon	21.18	26.50	1.251	78,185	48,017	.614
Cornwall	25.96	30.29	1.163	31,622	22,834	.722
<i>North—</i>						
Northumberland	29.85	34.17	1.145	12,620	5,765	.457
Durham	26.38	32.65	1.238	20,253	11,926	.589
York, N.R.	27.45	31.88	1.161	36,502	23,935	.656
„ W.R.	27.04	28.98	1.072	57,715	44,716	.775
<i>North-West—</i>						
Cumberland	30.09	31.52	1.048	6,969	1,991	.286
Westmorland	28.41	32.37	1.139	445	139	.312
Lancaster	29.93	34.18	1.141	21,324	18,456	.866
Chester	30.39	32.02	1.054	16,005	13,039	.815
Derby	29.07	32.36	1.113	16,736	13,570	.811
Stafford	28.08	30.94	1.102	29,373	19,674	.670

It will be noted that the yield ratio exceeds unity in every county but Cambridge and Leicester, and its value ranges from 0.956 in

the latter county to 1·251 in Devonshire. The acreage ratio in every case is less than unity and ranges from the value 0·286 in Cumberland to the value 0·919 in the East Riding of Yorkshire.

In Table 2 the broad changes in the groups of counties are given, treating each group as a whole.

TABLE 2.—*Percentage change of yield and acreage of wheat in the agricultural divisions of England.*

Division.	Percentage change.	
	Yield.	Acreage.
East	+ 4	— 17
North-East	+ 4	— 22
South-East	+ 9	— 32
East Midland	+ 4	— 23
West Midland	+ 8	— 34
South-West	+ 16	— 34
North	+ 13	— 32
North-West	+ 10	— 26
England	+ 7	— 25

So far as the above table goes, it shows that the increases of the yield have, as a rule, been greatest where the acreage has declined most. There is, however, much variation of the yield ratios within most of the groups, and the acreage ratios are also by no means consistent. I have therefore applied the method of correlation to the county figures.

Before, however, giving the results of correlating the ratios, I give in the two next tables certain results obtained with the actual figures of the yield and acreage in each county in each decade.

TABLE 3.—*Means and standard deviations of county yields (bushels) and areas (thousands of acres) in each decade.*

	Mean.	Standard Deviation.
Acreage, 1885-1894	51·5	± 42·9 (83 per cent.)
Yield per acre, 1885-1894	28·82	± 2·14 (7·4 „)
Acreage, 1899-1908	38·0	± 34·1 (90 „)
Yield per acre, 1899-1908	31·14	± 1·92 (6·2 „)

It should be mentioned that the mean yields per acre given in this table are simple averages of the county yields. The yields weighted by the acreage in each county (*i.e.*, the ordinary average yields for England as a whole) are 29·35 bushels and 31·39 bushels per acre respectively. The smaller difference between the simple

and weighted average in the second decade together with the slight decrease in the standard deviation of the county yields may perhaps be taken as an indication of a tendency for counties to be "levelled up" as regards the productivity of an acre.

TABLE 4.—*Correlation coefficients of yields and areas in each decade.*

	Coefficient.	Probable error.
1. Acreage (1885-94) and yield (1885-94)	+ '33	± '09
2. Acreage (1885-94) and acreage (1891-1908)	+ '98	± '04
3. Acreage (1885-94) and yield (1899-1908)	+ '17	± '10
4. Yield (1885-94) and acreage (1899-1908)	+ '35	± '09
5. Yield (1885-94) and yield (1899-1908)	+ '73	± '07
6. Acreage (1899-1908) and yield (1899-1908)	+ '17	± '10

Coefficient No. 1 indicates that counties growing a large crop of wheat tended to have a higher yield per acre in the decade 1885-94, than those with smaller areas under the crop. From the value of coefficient No. 6 it will be seen that this fact was not nearly so marked in the later decade. This change is in agreement with the suggestion just made that counties have been "levelled up" as regards their yields. The value of coefficient No. 2 is what one would naturally expect, the great wheat counties of 1885-94 remaining the dominant wheat counties of 1899-1908. Coefficient No. 5 shows that those counties which produced the heaviest crops still do so, but the "levelling up" process has left its mark on the value of this coefficient.

The next work consists in ascertaining the direct correlation of the yield and acreage ratios in the counties, in order to know whether the yield has improved most in counties where the area has declined most. Table 5 gives the result of this work.

TABLE 5.—*Means, standard deviations and correlation coefficient of acreage and yield ratios.*

	Acreage Ratio.	Yield Ratio.
Mean	'703	1'082
Standard deviation	± '1425	± '057
Correlation coefficient	— '316	± '091

The value of the coefficient in relation to its probable error justifies one, I think, in considering it to be definitely significant of a tendency for large decreases in the area of the wheat crop in the counties of England to have been accompanied by appreciable increments in the yield per acre returned from the counties. I do

not think, however, that one would be justified from this relation only, and without a measure of the influence of the many other factors in operation, in trying to estimate the actual increase of the yield which may be due to the withdrawal of less productive soils from wheat growing.

In Table 6 the working of the last correlation coefficient is reproduced because it brings out more clearly than the comparison shown in Table 2 the manner in which the different counties have contributed to the negative correlation obtained.

It will be seen that positive products are contributed chiefly from the west midland counties where the considerable decreases of area were generally unaccompanied by such marked improvements of the yield as took place in other parts of the country. In the north-western counties negative and positive products balance each other. In the eastern, north-eastern and east midland areas the lesser proportionate reductions of acreage are associated with smaller increments in the yield. In the northern counties over-average reductions of area are associated with over-average additions to the yield.

A further result of some interest is the correlation between the yield per acre of the earlier period and the acreage ratio. The value is $+ \cdot 09 \pm \cdot 10$. The tendency, if any, of a county with a low yield to show an over-average decrease of area may also be measured by the partial correlation between the yield of 1885-94 and the acreage of 1899-1908, the third variable being the acreage of 1885-94. This partial correlation coefficient is $\cdot 11 \pm \cdot 10$. These two coefficients are so small that it may be concluded that the area of wheat of a county has not been reduced specially on account of a low yield per acre, as compared with another county, although within a county the reductions seem to have helped toward raising the yield.

The results obtained may be summarised as follows:—

(1.) The reduction of the wheat area has been accompanied by a rise of the yield per acre in England as a whole.

(2.) The yields of separate counties have shown a slight tendency to level up.

(3.) Counties of low yields do not appear to have been specially selected for a reduction of area. (There has not been *inter-county* selection.)

(4.) Improvements of the yields appear, to some extent, to be greatest in those counties where the proportionate reductions of area have been greatest. (There has been some degree of *intra-county* selection.)

TABLE 6.—*Correlation of yield and acreage ratios.*

Divisions and counties.	Yield Ratio— Deviation from Average.	Acreage Ratio— Deviation from Average.	Products (6 decimal places).	
			Positive.	Negative.
<i>East—</i>				
Bedford	— '022	+ '136	....	2,992
Huntingdon	— '063	+ '162	....	10,206
Cambridge	— '096	+ '167	....	16,032
Suffolk	— '031	+ '116	....	3,596
Essex.....	— '042	+ '072	....	3,024
Hertford	— '004	+ '202	....	808
Middlesex.....	+ '032	— '197	....	6,304
<i>North-East—</i>				
Norfolk.....	— '042	+ '046	....	1,932
Lincoln	— '036	+ '063	....	2,263
York, E.R.	— '039	+ '216	....	8,424
<i>South-East—</i>				
Kent	+ '013	— '077	....	1,001
Surrey	+ '015	— '089	....	1,335
Sussex	+ '013	— '032	....	416
Berkshire	— '019	+ '067	....	1,273
Hampshire	+ '022	+ '011	232	....
<i>East Midland—</i>				
Nottingham	— '078	+ '068	....	5,304
Leicester	— '126	+ '115	....	14,490
Rutland	— '039	+ '081	....	3,159
Northampton	— '031	+ '094	....	2,914
Buckingham.....	+ '002	+ '039	78	....
Oxford	+ '005	+ '078	390	....
Warwick	— '041	+ '026	....	1,066
<i>West Midland—</i>				
Salop.....	— '057	— '127	7,239	....
Worcester.....	— '017	— '039	663	....
Gloucester	— '010	— '003	30	....
Wiltshire	+ '024	+ '046	1,106	....
Monmouth	— '046	— '271	12,466	....
Hereford	+ '044	— '092	....	4,048
<i>South-West—</i>				
Somerset	— '004	— '026	104	....
Dorset	+ '035	+ '010	350	....
Devon	+ '169	— '089	....	15,041
Cornwall	+ '081	+ '019	1,539	....
<i>North—</i>				
Northumberland	+ '063	— '216	....	15,493
Durham	+ '156	— '114	....	17,784
York, N.R.	+ '079	— '047	....	3,713
" W.R.	— '010	+ '072	....	720
<i>North-West—</i>				
Cumberland	— '034	— '417	14,178	....
Westmorland	+ '057	— '331	....	22,287
Lancaster	+ '059	+ '163	9,617	....
Chester	— '028	+ '112	....	3,156
Derby	+ '031	+ '108	3,348	....
Stafford.....	+ '020	— '033	....	660
Number of counties = 42	Totals		+ '051340	— '169431
	Net total		— '118091	

DISCUSSION *on* MR. VIGOR'S PAPER.

MR. YULE said that he had much pleasure in moving a vote of thanks to Mr. Vigor, as his investigation had interested him greatly. He could not pretend, however, to any agricultural knowledge, and must therefore content himself with merely asking one or two questions. He thought the two most important conclusions in the Paper were the third and fourth; namely, that counties of low yields did not appear to have been specially selected for a reduction of area under wheat, or, in other words, that counties with a very low yield per acre in the earlier decade did not exhibit on the whole a sensibly greater reduction of area than counties which showed a high yield per acre in the first decade, and that improvements of the yield in counties appeared to be greatest where the reduction of area had been greatest. Apparently within each county, so far as one could judge, there had been either some selection of soil better suited to wheat-growing, or, at all events, there had been some causes in operation associating the improvement in yield with the magnitude of reduction in acreage. At the same time, that relation was not, he confessed, so marked as he should have expected *à priori*. The data given in the Paper by Mr. Hooker, to which reference had been made, moreover did not, apparently, lend any support to the hypothesis that the reduction of acreage in any place was markedly associated with the increase of yield; *à priori* he should have expected such an association. Farmers were bound to be intelligent people, and he would have thought that when the area under wheat was decreased it would be the portion of the farm most suitable for wheat-growing which would be retained under that crop. He was curious to know why this relation was so slight, and would be glad if the author could suggest why there was no inter-county selection—why the counties with low yields per acre in the earlier decade had not, apparently, been selected for a special reduction of area. If the wheat produced was largely consumed locally, he could imagine the area under wheat in each county would tend to remain about the same, more or less independently of the amount in other counties; but otherwise the result seemed, to the non-agricultural person like himself, to deserve some explanation.

Dr. W. N. SNAW said he had much pleasure in seconding the vote of thanks, though he feared he was standing in the way of those better qualified to discuss the agricultural aspects of the Paper. He had come partly to find out whether he could discover why in the last few years the yield of wheat had remained so remarkably steady and so high. Looking at the curve at the beginning of the Paper, one saw that the last four years had been singularly uniform, much more so than in any previous four years, with the exception, perhaps, of the years 1888 to 1891; and the four uniform years had been uniformly high, which was a curiosity in the diagram, because the most characteristic feature was the oscillation from year to year which seemed to have died out of the statistics. This had been rather disturbing to him since, some years ago, he was driven to

the conclusion, much against his will, that, not for the whole of England, but for a limited portion of it, viz., the eastern counties, including Norfolk, the yield repeated itself after a period of eleven years. It was a shocking thing to confess that anything would repeat itself after eleven years in these days; but he was driven to that conclusion, not by any *à priori* desire to arrive at it, but by the impossibility of escaping from the situation. If one took the curve for the eastern counties, instead of for the whole of England (a corresponding diagram to that at the beginning of the Paper), it showed that the relation was very close indeed. He had always supposed that the efforts made to increase the yield of wheat deliberately during the last thirty years, such as improvement in manures, and the attention given to the subject, must have produced a distinct effect, and that possibly the effect of greater attention to the growth of the crop was showing itself by an increase in the yield, and perhaps by the elimination of the oscillation in alternate years. The Paper suggested that some part of the result was due to the fact that unproductive land had been withdrawn from cultivation; and that might produce some effect, probably more effect on England as a whole than it would on the favoured counties. He noticed that the counties he spoke of were really those in which the yield ratio was nearer unity than in England as a whole; but he was a little disturbed by the character of the first curve. The yield of wheat went up from 1894 to 1899; and at the same time the acreage under wheat also progressed upwards along a curve reasonably parallel. Consequently, during those four years there was a simultaneous increase of the yield and the acreage. That led him to ask what would be the result if they correlated chronologically the yield of the year and the acreage for the year, which had not been done in the Paper. Probably the number of years available was so small that the correlation ratio would have no serious meaning; but it would be interesting to know how the numbers would work out. He hoped the Paper would lead to agriculturists looking into the matter as to whether there was a definitely improved yield so far as wheat was concerned; and whether the attention paid to agriculture had developed greater productivity in wheat to such an extent as to diminish the two years' oscillation to which he had referred.

Mr. R. H. HOOKER congratulated the author upon the Paper, which he had read with very great interest. He thought the method adopted was not only ingenious, but, so far as he could see, it was the right method of attacking the particular problem in question. Mr. Vigor had alluded to the possibility of more favourable weather having affected the wheat yield; he thought it was certain that, comparing the yields of the latest decade with the earlier one, the weather at the time of sowing had been much more favourable in the more recent period. But, owing to the method adopted, he (Mr. Hooker) thought it probable that the author had largely eliminated the effect of the weather. His own investigations a few years ago had given no evidence in support of the theory that a decreased acreage had resulted in an increased yield per acre; but

he was not then specially studying that point. He had calculated the correlation coefficients for which Dr. Shaw had asked, basing them on the data he had used in his own paper, *i.e.*, the acreage under wheat, and the yield per acre in the twenty-one years 1885 to 1905 in a certain district in the East of England. Correlating these in the ordinary way, he got a coefficient between yield and acreage of $+0.23$, instead of Mr. Vigor's -0.346 . *A priori* it was to be expected that this total coefficient should be positive, since the chief factor in the yield of wheat was the deficiency of rainfall in the autumn, and one of the chief factors in the acreage was also that same deficiency in rainfall in the autumn. He had then calculated the partial coefficient, to eliminate the effect of the rainfall at the time of sowing, and the result was to raise the figure to $+0.31$. He confessed he did not quite understand that, and did not see why the partial coefficient should not approximate to the figure obtained by Mr. Vigor; or, at least, that it would be of the same sign. However, in correlating the changes chronologically, other factors, *e.g.*, the weather at other times of the year, also produced their effect; and some of those other factors, doubtless, accounted for the apparent correspondence of an increased yield with an increased acreage. He had also correlated his own data by the method of taking the differences between successive observations instead of differences from the mean. In that way he had obtained an even higher coefficient between yield and acreage, *viz.*, $+0.5$; the partial coefficient, after allowing for the autumn rainfall, being $+0.41$. That was an even higher figure than Mr. Vigor had obtained, and of opposite sign; but the probable error was greater. He had little doubt, however, that Mr. Vigor's method was the correct way of tackling that particular problem, and that in his own calculations some disturbing factor was involved. Another point, which he had previously discussed with Mr. Vigor, was the question whether the county ratios should have been weighted according to the area under wheat in the county. He had at first thought it hardly worth while, but he was now not so certain. Looking at Table 6, no less than 0.022 of the numerator (-0.118) was due to a single county, Westmorland, which had the smallest acreage of all under wheat. If, *e.g.*, Cumberland and Westmorland had been treated as a single county, the coefficient would have been smaller. He would accordingly like to ask Mr. Vigor what the correlation coefficient would be if he weighted the counties before calculating it.

Mr. ROSENBAUM said that some time ago he was dealing with some Irish figures which bore closely on the question under discussion, and he might remind the author that the Irish figures afforded a better basis for testing the theory, because they covered a much longer period, going back to the fifties. He was struck by finding that, on comparing the period 1859-68 with 1899-1908, one got a decline in the average wheat acreage of 88 per cent., and an increase of yield per acre of 55 per cent. The question occurred to him as to how far that increase of yield was due to improvements in farming, and how far to the selection of better soils. It seemed

to him that some evidence bearing on that question might be obtained by a corresponding examination of the oats and barley figures. In the case of oats, where the decline in acreage was only 41 per cent., the increase of yield was 36 per cent. In the case of barley, where the decline in acreage was 9 per cent., the increase of yield was 21 per cent. One would expect that improved husbandry, weather conditions, and factors of that kind would be common to wheat, barley, oats, and different kinds of grain; and, therefore, that any improvement due to those causes would be manifested in the different grains. But one got a decline of only 9 per cent. in the barley area, so that there could not be very much selection taking place in the cropping. There was, however, an increase of 21 per cent. in the yield; and therefore that was probably the measure of improved farming methods. The 21 per cent. increase of yield ratio in barley might, therefore, be compared with 88 per cent. in the case of wheat, and 36 per cent. in the case of oats. Those figures were very interesting as showing that there must have been in the large reduction which had taken place in the wheat areas of Ireland a considerable influence through selecting only those soils which naturally gave the largest yield. He would say that those figures might suggest to Mr. Vigor a fruitful soil to work on in trying to examine that particular question. It also occurred to him, while Mr. Yule was speaking, that it might be possible to explain why there were so many counties where the correlation between the increased yield per acre and the reduction of acreage was very small. He did not know how far agriculturists would bear him out, but he did not think they could expect a close relationship between the yield per acre and the acreage, in the cases where the wheat area was small. There was in most places a *minimum* below which the cultivation of wheat would not go, since the farmers required wheat, irrespective of price, for the making of straw. Under those conditions, supposing one had a joint influence of low prices tending to produce small cultivation, and an improved farming tending to produce a higher yield, the one would go on steadily while the other remained constant. Mr. Vigor's method appeared to assume a linear relationship between the increase of yield per acre and the reduction in acreage, even in cases where the wheat area was small. But if, as he suggested was the case, it had any influence at all, there must be many counties where that relationship no longer held.

Mr. YOUNG said if they looked at the acreage figures they would be found to compare very remarkably with the price of wheat; the acreage decreased as the price went down. There was also the question of weather, which largely entered into the discussion. If Mr. Hooker would consider the price of wheat at the same time as the weather, he would find that the figures he quoted would come out very much better. He had been very much interested in Mr. Hooker's remarks that if the autumn was fine there would be a much larger yield of wheat than if it were wet; and he would like to see the result of this year's yield of wheat as compared with last year's. The previous year had been splendid for wheat growing, and

they had had a large yield. He would be interested to see what the yield would be this year, since, according to Mr. Hooker's theory, it would only be a small one.

Mr. REW cordially supported the vote of thanks to Mr. Vigor for his very interesting contribution. He had done what might well be an example to other young Fellows of the Society: he had taken a small plot of the very large field of agricultural statistics, and had applied to it the method of intensive culture. His results were exceedingly interesting; and the fact that they did not perhaps conclusively prove very much was not greatly surprising. The problem which Mr. Vigor had tried to investigate was to ascertain whether some of the increase in the yield per acre of wheat since 1885, and if so how much, was due to the withdrawal of less productive soils from wheat-growing. *A priori* it might seem reasonable to expect that as the acreage of a particular crop was reduced, self-interest should induce the cultivator to throw out of cultivation the least productive soils. But that did not necessarily mean the least productive in the sense of yield per acre, but the least productive from the economic point of view. The reduction of wheat acreage was much greater in the twenty years preceding the period with which the Paper dealt than in the last twenty years. When they first knew the exact figures, about 1866, the acreage of wheat in England was about 3,200,000. At the time when Mr. Vigor began his inquiry it was something like 2,300,000, a loss of nearly 1,000,000 acres, and since then over 500,000 acres more had gone. The first loss, as anyone acquainted with the history of events during that period would agree, was due to the great fall in wheat prices; they were up to 50s. and 60s. per quarter at the end of the sixties; but in 1885 they were down to 30s.; and that fall in price was the immediate cause of the great decrease of acreage. The process which went on was that the soils which went out of cultivation were those which were most expensive to cultivate, and not necessarily those which were the least fertile or which gave the smallest yield per acre. It had been already indicated that there were other considerations, perhaps even more potent with farmers than the actual yield per acre, which led to the reduction of the area under wheat. Farmers had been tempted to take up dairying or stock rearing or breeding, or perhaps the cultivation of fruit or vegetables, all of which industries had unquestionably been extending while wheat-growing had declined. The question was whether it was not the fact that those industries were relatively more remunerative than the growing of wheat, which had been a more potent influence in reducing the wheat acreage than the consideration of whether particular land yielded a bushel or two more per acre than other parts of a district or farm. If that were so the evidence that the increase in the average yield per acre of wheat, which had undoubtedly taken place, was consequential upon the reduction of acreage by reason of the gradual elimination of the less suitable soils might be expected to be inconclusive.

Mr. VIGOR, in reply, having thanked those who had taken part in the discussion for the kindness which had tempered their

criticisms, said that several of the points raised by the earlier speakers had been answered by the later speakers. Mr. Yule's remark that the size of the coefficient of correlation between the yield and acreage ratios was not so great as he had expected, had been met by Mr. Rew, who said that the economic productivity of the soil was a greater consideration to the farmer than the mere quantity of the crop. Dr. Shaw's questions had been answered by Mr. Hooker, and he (the speaker) agreed that Mr. Hooker's results were difficult to account for, and suggested that there was probably some factor in the chronological correlation, such as the price, mentioned by Mr. Young, the later weather and conditions of the season, which he had not dealt with in the Paper and had really eliminated to some extent, which might account for the positive correlations which Mr. Hooker had obtained. Mr. Hooker had also mentioned the question of the probable error of the coefficient of correlation between the ratios. He (the speaker) knew that Mr. Bowley took six times the probable error as a criterion of its significance; but that criterion almost precluded one from dealing with a question if one had a small number of observations giving small coefficients, and one could in such small samples only deal with relations which were almost obvious. Mr. Hooker had also mentioned the question of weighting, and had pointed out that Westmorland contributed a large proportion to the aggregate negative correlation. On the other hand, other counties with small acreages, such as Monmouth and Cumberland, contributed a large amount to the positive column of the correlation; and these must be set against counties like Westmorland. The use of data for areas of different sizes might be likened in effect to the process of drawing balls out of a bag containing black and white balls in a certain proportion. Even if one took a larger handful at one time than at another one would expect, in the long run, that the small areas which showed abnormal proportions of black balls in one direction would be balanced by others which showed abnormal proportions in the other direction. He had actually spent much time in using weighted ratios, but an assumption of some kind, as to the nature of the distribution of the ratios within a county, was involved, and he did not know what assumption was possible; and that being so, he could not go any further in the matter. It might however be stated that by taking the weighted ratios the correlative coefficient had come out $-.51$, which was a higher value than his coefficient for unweighted ratios ($-.346$); but he did not wish to put that higher value forward as supporting the results of his investigation, because it was based on those assumptions which he had been unable either to accept or reject.

The following Candidates were elected Fellows of the Society:—

Alfred Akers.
 Frank Beresford.
 Edward J. Duveen.
 George Haw.
 Edward William Hope.

Stephane Kahn.
 H. Allan Morgan.
 H. Cooper Pattin.
 Peter Mackenzie Rea.
 Ernest Charles Snow.

OBITUARY.

Franz Ritter von Juraschek.

ONCE again Death has made a sad gap in the ranks of the Honorary Fellows of this Society. Within the last few years our roll of distinguished foreign colleagues has suffered successively by the loss of such masters of statistical and economic science as Von Inama-Sternegg, Carrol D. Wright, Nicolas Pierson, and Emile Cheysson. Now we have to deplore the unexpected death, at the relatively early age of 61, of the distinguished Austrian statistician, Doctor Franz Ritter von Juraschek, who in 1895 had followed the late President of the International Statistical Institute in the chair of the Imperial and Royal Austrian Central Statistical Commission. The personal services rendered by Dr. von Juraschek, not only to statistical science and statistical administration in his own country but likewise in the field of international comparisons, have been widely recognised by those who had the advantage of being his comrades at the various gatherings of the International Institute.

Dr. Juraschek was born at Arad, in 1849, and educated at Graz, where, after taking his degrees of Doctor of Philosophy and of Doctor of Laws, he entered on tutorial work in the Faculty of Public Law in 1875. Specializing later in Statistics, he became Professor of Statistics and Austrian Public Law in the Francisca Josephina University in Czernowitz in 1881, and Extraordinary Professor of Statistics and Constitutional and Administrative Law at Innsbruck in 1883. His name first appears on the roll of members of the International Statistical Institute in 1886, and he will be remembered by those of our countrymen who attended the Vienna session of that body in 1891 and on many subsequent occasions as one of the most kindly and charming of our colleagues. He was chosen an Honorary Fellow of the Royal Statistical Society in 1893, and he was also a member of the Royal Economic Society. Outside his own nationality his merits were further recognised by his selection as a member of the American Academy of Political and Social Science, a corresponding member of the Belgian Central Statistical Commission, and of many learned and benevolent societies. The distinctions which he worthily bore included the Austrian Order of the Iron Cross, that of the Crown of Italy, and that of the Danish Order of the Danebrog. Bearing the title of Regierungsrat from 1887, in 1894 he was named Hofrat, in 1901 Wirklicher Hofrat, and in 1904 Commander of the Francis Joseph Order.

When, on the retirement of Dr. von Inama-Sternegg from the

head of the Austrian Central Statistical Commission in 1905, Dr. Juraschek was chosen as his successor, with the position of *Sektionschef*, he confined (as official duties laid an increasing burden on his vigorous and energetic personality) his academic work to that of the University of Vienna.

In the high statistical post he so ably filled, his shrewd and expert knowledge, his conscientious devotion to accuracy, combined with much literary activity, made up a life of singular force and great attractiveness, the far too early loss of which will not be soon repaired. Nor will it be forgotten with what conspicuous ability he continued the famous work *Übersicht der Weltwirthschaft*, started by his deeply-lamented countryman, Dr. Neumann Spallart, to whose efforts in 1885 the resurrection of the existing International Statistical Institute was so largely due. Amongst the other works of our energetic deeply-regretted colleague, it may suffice to note his connection with Otto Hübner's *Geographisch Statistische Tabellen aller Länder der Erde*, while shortly before his death he was engaged on the revision and republication, with the authorisation of the Imperial and Royal Ministry of Agriculture, of his work, *Das Getreide im Weltverkehr*.

No complete record of the mass of his published documents bearing on trade, population, agriculture, transport, prices, and topography could, however, possibly find recognition in the limited space at our command. Those who would desire to measure the recent scope of his international work may trace it in the bulletins of the International Statistical Institute, where his notes on European land areas and population commanded attention, and where the interest with which he was pursuing, still more lately, the improvement of fishery statistics, is displayed; while his close concern with the recent congress on this subject abundantly testified to the activity he brought to the prosecution of a comparatively modern side of statistical research.

P. G. CRAIGIE.

MISCELLANEA.

The Statistics of Wages in the United Kingdom during the Nineteenth Century. (Part XVIII.) *The Cotton Industry.* Section IV.

By GEORGE HENRY WOOD, F.S.S.

Yorkshire.

The West Riding of Yorkshire has had a more or less flourishing cotton industry from the commencement of the factory system, and the industry thrives to-day at Halifax, Brighouse, Slaithwaite, and elsewhere. I have not, however, been able to trace many references to wages in this district. Such particulars as I have been able to discover are given in Table 28, but they have little value, on account of their incompleteness. We cannot make any estimates of the course of wages, although the particulars leave no doubt that a very considerable advance has taken place.

Miscellaneous Lancashire centres.

Although we are unable to make any further use of them, there are certain particulars relating to different places in Lancashire which it seems desirable, for the sake of completeness and for future reference, to place on record. They are given in Table 29. The table calls for no comment, except to add that :

(a.) The figures relate to Lancaster, and are from the same authority as the rest of the statements in this column.

(b.) In 1840 the spinners averaged 24s. 9d.

(c.) At other mills the wages were 6s. 9d. and 7s.

(d.) The earnings are for short wheels, and were subject to a deduction of 2s. 6d. or 3s. for gas during six months of the year.

(e.) The earnings are for large wheels, and were subject to a similar deduction for gas as (d).

(f.) From Report of Factory Inspector, xxii of 1864.

TABLE 28.—YORKSHIRE. *Average earnings of cotton operatives at various periods. 1837-1907.*

District.....	Skipton.		Skipton.		Craven.		Huddersfield.		Halifax.		Yorkshire.		Brighouse.	
	1837.		1841.		1841.		1849.		1856.		1906.		1907.	
	26.		26.		26.		3.		1.		1.		17.	
	s.	d.	s.	d.	s.	d.	s.	d.	Number.	Wages.	Number.	Wages.		
Mixers	—	—	—	—	—	—	—	—	11	s. 18 4 d. 4	11	s. 21 2 d. 2	s. d. 20 —	
Seutchers. M.	—	—	—	—	—	—	12 —	—	53	17 11	27	21 8	—	
Strippers and grinders	10 —	—	10 —	—	9 13/-	—	12 —	—	76	18 10	38	23 1	21/-, 23/-	
Carding overlookers	19 —	—	19 —	—	21/-, 27/-	—	12 —	—	40	29 1	24	35 3	40 —	
Drawing tenters	6 3	6 3	6 3	6 3	6 6	6 6	9 —	—	109	12 10	55	15 4	10 6	
Bobbin and fly	—	—	—	—	—	—	7 6	10 —	—	—	—	—	—	
Slubbing tenters	6 3	6 3	6 3	6 3	6 6	6 6	—	—	330	13 2	48	16 5	12 6	
Intermediate tenters	—	—	—	—	—	—	—	—	—	—	61	15 10	12 6	
Roving tenters	6 3	6 3	6 3	6 3	6 6	6 6	—	—	439	13 1	130	15 1	12 6	
Tenters average	—	—	—	—	—	—	—	—	20	2 11½	354	15 1*	—	
Little tenters	—	—	—	—	—	—	—	—	62	7 3	—	—	7 6	
Spinning overlookers	—	—	—	—	—	—	—	—	14	38 8	19	34 4	40 0	
S.A. minders. M.	22 —	—	26 —	—	17/-, 20/- 14/-, 16/-	—	—	—	364	28 6	199	32 5	30 0	
W.	—	—	—	—	9/-, 10/-	—	—	—	—	—	—	—	—	
Big piccers	6 —	6 —	6 —	6 —	4 —	—	—	—	380	12 9	316	15 7	15 —	
Little piccers	2 —	2 —	2 —	2 —	2 9	—	—	—	113	2 11½	170	10 7	6/-, 7/-	
All piccers	—	—	—	—	—	—	—	—	223	8 7	486	13 10	—	
Twins	—	—	—	—	—	—	—	—	716	9 11	180	33 8	36 —	
Twinner piccers	—	—	—	—	—	—	—	—	243	30 3	—	—	16/-, 7/-	
	—	—	—	—	—	—	—	—	179	2 11½	—	—	—	
	—	—	—	—	—	—	—	—	673	11 3	—	—	—	

* Including 60 frame tenters unclassified at 12s. 11d.

† Half-timers.

TABLE 28 *Contd.*—YORKSHIRE. *Average earnings of cotton operatives at various periods, 1837-1907.*

TABLE 20 Contd. — LIVERPOOL AND DISTRICTS

District.....	Skipton.		Skipton.		Craven.		Huddersfield.		Halifax.		Yorkshire.		Brighouse.		
	1837.	26.	1841.	26.	1841.	26.	1849.		1886.		1906.		1907.		
							s.	d.	s.	d.	s.	d.			
Authority.....	26.		26.		26.		s.	d.	Number.	Wages.	Number.	Wages.	17.		
Throstle overlookers	s. d.		s. d.		s. d.		s.	d.	2	29	—	s. d.	s. d.		
" spinners.....	—	—	—	—	—	—	—	—	—	—	52	15	3	—	
Reelers	—	—	—	—	—	—	9	—	425	11	4	13	3	—	
Winders	—	—	—	—	—	—	14/-, 7/6	10	211	12	6	14	6	—	
Doublers	—	—	—	—	—	—	—	9	—	—	585	12	9	—	
Warpers. W.	—	—	—	—	—	—	—	6	42	15	10	18	4	—	
Warpers. M.	—	—	—	—	—	—	17	—	32	29	3	—	—	—	
Twisters-in	—	—	—	—	—	—	—	—	—	—	77	23	11	—	
Weaving overlookers	—	—	—	—	—	—	—	—	14	25	8	136	37	6	
Weavers, 2 looms.....	—	—	—	—	—	—	—	—	—	—	404	13	6	—	
" 3 "	—	—	—	—	—	—	—	—	—	—	332	17	10*	—	
" 4 "	—	—	—	—	—	—	—	—	—	—	1,714	22	5*	—	
" 6 "	—	—	—	—	—	—	—	—	—	—	64	32	1	—	
Average per weaver.....	—	—	—	—	—	—	—	—	—	—	2,514	20	8	—	
Looms per weaver	—	—	—	—	—	—	—	—	—	—	36	—	5	8/9	
Average per loom.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Mechanics.....	—	—	—	—	—	—	—	—	9	29	11	—	—	26	—
Engineers	—	—	—	—	—	—	—	—	25	28	2	54	—	30	—
Joiners	—	—	—	—	—	—	—	—	—	—	—	—	—	23	—
Labourers	—	—	—	—	—	—	—	—	—	—	31	21	3	23	—
Stokers and oilers	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—
Average of all	—	—	—	—	8	—	—	—	3,992	14	6	7,286	18	11	—

* Including fustian weavers. 3 looms, 52, 15s. 8d.; 4 looms, 37, 19s. 7d. and 201, 22s. 3d.

TABLE 29.—*Miscellaneous Lancashire Centres. Average earnings of cotton operatives for an ordinary week's work. 1833-1906.*

District.....	Warrington. 1833.	A country town. 1841.	Wigan. 1841.	Wigan. 1842.	?	?	Warrington. 1883.	Carlisle.		Miscellaneous Lancashire.		" Other towns.	
								1886.		1886.		1906.	
								1.		1.		2.	
Year	4 and 40.	26	26	54	(f.)	(f.)		Number.	Wage.	Number.	Wage.	Number.	Wage.
Authority.....													
Mixers	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.		s. d.		s. d.		s. d.
Seutchers, M.....	—	15 —	—	—	10 6	—	—	6	15 3	21	16 9	—	—
" W.....	—	7/2, 8/6	—	—	—	—	18 8	5	19 5	34	19 7	—	—
Strippers and grinders	—	8/2, 9/2	—	—	—	—	8 —	23	8 9	49	9 10	—	—
Lap and can tenters	—	10/2, 11/-	—	—	—	—	20 9	27	18 11	123	19 5	44	24 —
Drawing tenters	6 1	—	7 —	—	—	—	10 —	20	7 10	66	8 8	—	—
Slubbing tenters	6 2	W. 8/2, 8/6	7 —	5/6, 7/6 (a)	—	—	12 6	47	10 8	150	12 6	119	13 1
Intermediate tenters	5 10	8/6, 10/-	7 —	—	—	—	13 —	113	12 4	577	14 —	68	15 4
All tenters	—	G. 6 —	7 —	7 8, 8/6	—	—	13 —	160	11 10	727	13 8	33	14 5
Little tenters	—	3/2, 5/-	3 —	—	—	—	5/4, 6/8	46	6 4	95	7 5	380	14 6
Carding overlookers	17 6	12/2, 14/-	—	—	—	—	35/2, 42/-	11	31 6	54	31 3	26	32 5
Spinning overlookers	28 10	20/2, 25/-	—	—	25 —	—	49 —	7	32 10	20	37 5	14	35 3
S.A. minders	24 —	25/-, 28/- (d)	20/5 (d)	—	16 6	—	34 9	93	26 9	361	33 3	73	40 —
Piecers. 1st	5 —	30/2, 34/2 (c)	6/-, 8/-	—	13 —	—	13 —	—	—	358	13 —	—	—
" 2nd	2 6	8/2, 8/6	3 2	—	7 —	—	8 3	—	—	261	8 4	—	—
" 3rd	—	4 6, 6/-	1 8*	—	—	—	6 —	—	—	—	—	—	—
All piecers	—	2/2, 2/6	—	—	—	—	—	85	10 10	619	11 —	—	—
Throstle overlookers.....	—	—	—	—	—	—	30/2, 45/2	3	25 3	12	24 9	—	—
" spinners	4 8	—	7 6 (c)	8 —	7 —	—	22/6	43	11 6	166	10 3	311	11 5
" doffers	—	—	4 —	—	—	—	9/2, 11/6	20	2 4*	32	6 1	—	—
							7 8 {		4 10 {				

* Half-timers.

TABLE 29 *Contd.*:—*Miscellaneous Lancashire Centres. Average earnings of cotton operatives for an ordinary week's work. 1833-1906.*

District.....	Warrington. 1833.	A country town.	Wigan. 1841.	Wigan. 1842.	?	?	Warrington. 1853.	Carlisle. 1856.	Miscellaneous, Lancashire.	" Other " towns.	
Year	1833.	26	26	54	(f.)	(f.)	(f.)	1.	1.	2.	
Authority.....	4 and 40.										
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	Number.	Wage.	Number.	Wage.
Reelers	—	—	—	—	—	—	s. d.		s. d.		s. d.
Winders	—	—	—	—	—	—	{ 11 6, 12 5, 14 }	369	12 —	227	8 11
Warpers, W.	10 11	—	—	—	—	—	—	1,213	11 9	542	12 11
Drawers-in	—	—	—	—	—	—	—	26	19 7	51	19 7
Twisters-in	—	—	—	—	—	—	—	5	25 2	—	—
Sizers and dressers ..	30 9	—	—	—	—	—	—	17	16 3	—	—
Reachers-in, Full-timers ..	—	—	—	—	—	—	—	10	30 6	—	—
Half-timers	—	—	—	—	—	—	—	20	—	—	—
Doublers	—	—	—	—	—	—	—	11	1 11	—	—
Weaving overlookers ..	22 7	—	—	—	28 3	21 6	38 —	26	35 11	109	39 7
Weavers, 1 loom	—	—	—	—	—	—	—	—	—	—	—
" 2 "	—	—	7 —	—	10 4	7 11	11 6	306	9 3	866	11 8
" 3 "	—	—	—	—	—	—	16 6	277	11 3	537	16 3
" 4 "	—	—	10 11	—	15 5	11 10	19 —	320	19 —	855	17 9
" 6 "	—	—	—	—	—	—	—	75	25 —	—	—
" average	11 10	—	—	—	—	—	—	903	11 3	2,258	15 1
Average per loom	—	—	—	—	—	—	—	4 8 6	4 11 3	—	5 0 3
Looms per weaver	—	—	—	—	—	—	—	—	3 0 1	—	3 0 0
Weavers assistants, Full-timers	—	—	—	—	—	—	—	75	4 3	—	—
Weavers assistants, Half-timers	—	—	—	—	—	—	—	226	2 2	—	—
Mechanics	—	—	—	—	—	—	—	21	30 5	36	33 11
Labourers.....	—	—	—	—	—	—	16½ to 20½	31	17 1	27	19 9
Average of all	9 1	—	—	—	—	—	—	2,440	12 4	6,499	14 1

Glasgow and other Scottish places.

The history of wages in the Scottish cotton trade is, as is the history of the trade itself, one entirely unlike that of its Lancashire rival. In Lancashire the trade has grown from decade to decade, in Scotland it has so dwindled that, whereas 100 years ago probably one-seventh of the cotton product of the kingdom was of Scottish manufacture, to-day the amount produced in Scotland is almost insignificant in proportion to the rest of the United Kingdom.

In 1835 the Factory Inspector's Returns of the numbers employed in cotton factories show 32,580 operatives in Scottish factories, compared with 182,243 in the factories of England and Wales. In 1901 there were only 26,297 in the Scottish factories, and 494,678 in those of England and Wales. Various investigators have drawn attention to the decline of the Scottish cotton industry, and have discussed its causes. In doing so they have discussed questions of wages, and have thereby provided much material for an account of the course of wages during the century. This material is tabulated in Table 30.

A glance at this table will reveal various features not met with in the tables relating to English centres. The list of operatives is longer, various occupations drop out as time goes on, and women are employed in several branches in Scotland when men are employed in Lancashire. The great changes which have been made add considerably to the difficulty of constructing index-numbers, and we cannot be so sure of our results as in the case of places where the main structure of the industry has not undergone the remarkable changes which the almost entire disappearance of mule spinning, the employment of women as spinners, &c., have brought about.

TABLE 30.—SCOTLAND. *Average earnings of cotton operatives for an ordinary week's work. 1810-1906.*

Year	1810-25.	1824.	1825-30.	1830-35.	1831.	1833.	1838.
Place	Glasgow.	Glasgow.	Glasgow.	Glasgow.	Glasgow.	Lanark.	Glasgow.
Authority.....	**	42.	**	**	3.	5.	24.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutchers overlookers	—	—	—	—	—	—	—
Carding masters	—	—	17 9	16 10	—	—	—
Pickers	—	—	—	—	—	—	7 —
Mixers	—	—	—	—	—	—	—
Scutchers	—	—	—	—	—	—	14 —
Strippers	—	—	—	—	—	—	—
Grinders	—	—	—	—	—	—	6 6
Drawing frame tenters	—	—	—	—	—	—	6 6
Slubbing frame tenters	—	—	—	—	—	—	—
Intermediate frame tenters	—	—	—	—	—	—	7 —
Roving frame tenters	—	—	—	—	—	—	—
All tenters, average	—	—	—	—	7½, 8½	—	4 6
Little tenters	—	—	—	—	—	—	8 6
Stretchers	—	8½, 10½	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—
Self-acting overlookers	—	—	—	—	—	—	—
Spinners, 1st class.....	—	—	—	—	27 —	—	—
" 2nd "	—	—	—	—	21½, 27 —	—	—
" 3rd "	—	—	—	—	—	—	—
" women	—	—	—	—	—	—	—
" average.....	—	23/- to 25/-	20 2	26 1	12½, 15½	7½, 9½ (4)	20½, 29½
Piecers, 1st class	—	—	—	—	7½, 8½	16½, 20½	6 —
" 2nd "	—	—	—	—	4½, 5½	—	3 6
" 3rd "	—	—	—	—	2½, 2 6	—	2 —
" average	—	—	—	—	—	—	—
Throstle spinners. W.....	—	—	—	—	—	—	7 —
" " G.....	—	—	—	—	—	—	—
" " Average	—	—	—	—	—	—	—
Reelers overlookers	—	—	—	—	—	—	—
"	—	—	—	—	7½, 8½	—	6 6
Winders	—	—	—	—	7½, 8½	—	—
Warpers. M.	—	—	—	—	—	—	—
" W.	—	—	—	—	—	—	—
Hand loom warpers	—	—	—	—	(1)	—	—
Twisters-in	—	—	—	—	—	—	—
Power loom overlookers	—	—	—	—	—	—	—
" weavers, 1 loom	—	—	—	—	—	—	—
" " 2 looms	—	—	—	—	—	—	—
" " 3 "	—	—	—	—	—	—	—
" " 4 "	—	—	—	—	—	—	—
" " average	—	7½, 10½	—	—	—	—	—
Tappers.....	—	—	—	14 —	—	—	—
Calenderers.....	15 —	—	15 —	15 —	15½ (1)	—	—
Sizers, dressers, &c.	—	—	—	—	—	—	—
Card minders	—	—	—	—	—	—	—
Foremen mechanics.....	—	—	—	—	—	—	—
Engineers.....	—	—	—	—	—	—	—
Mechanics and millwrights	—	—	—	—	—	—	—
Blacksmiths;	—	—	—	—	—	—	—
Joiners	—	—	—	—	—	—	—
Firemen	—	—	—	—	—	—	—
Labourers.....	—	—	—	—	—	—	—
Average of all	—	—	—	—	—	—	—

TABLE 30 *Contd.*—SCOTLAND. *Average earnings of cotton operatives.*

Year	1838.	1841.	1841.	1851.	1856.	1856.	1856.
Place	Glasgow.	—	Glasgow.	Glasgow.	Glasgow.	?	?
Authority.....	**	—	56.	56.	56.	20a.	20b.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutehers overlookers	—	—	—	—	—	—	15 —
Carding masters	17 6	—	—	—	—	—	20 —
Pickers	—	—	—	—	—	5 7	—
Mixers	—	—	—	—	—	—	12 —
Scutehers	—	—	—	—	—	—	—
Strippers	—	—	—	—	—	—	10 6
Grinders	—	—	—	—	—	9 6	10 6
Drawing frame tenters	—	—	—	—	—	5 5	—
Slubbing frame tenters	—	—	—	—	—	—	—
Intermediate frame tenters ...	—	—	—	—	—	—	—
Roving frame tenters	—	—	—	—	—	—	—
All tenters, average	—	—	—	—	—	—	5 11
Little tenters	—	—	—	—	—	—	—
Stretchers.....	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—
Self-acting overlookers	—	—	—	—	—	—	24 —
Spinners, 1st class.....	—	—	—	—	—	—	—
" 2nd	—	—	—	—	—	—	—
" 3rd	—	—	—	—	—	—	—
" women	—	—	—	—	—	—	—
" average	28 10	23/-, 30/-	21 —	21/-, 25/-	20/-, 35/-	6 7	6 9
Piecers, 1st class.....	—	—	—	—	—	—	—
" 2nd	—	4 —	—	—	—	—	—
" 3rd	—	2 —	—	—	—	—	—
" average	—	—	—	—	—	—	4 —
Throstle spinners. W.....	—	—	—	—	—	—	—
" " G.....	—	—	—	—	—	—	—
" " Average ...	—	—	—	—	—	3 7	—
Reclers overlookers	—	—	—	—	—	—	15 6
"	—	—	—	—	—	—	4 9
Winders.....	—	—	7 6	8 —	9 —	—	—
Warpers. M.....	—	—	—	12 —	17 —	—	—
W.....	9 6 (3)	—	—	—	—	—	—
Hand loom warpers	—	—	—	—	—	—	—
Twisters-in	8 4	—	—	9 —	12 —	—	—
Power loom overlookers	—	—	—	30 —	40 —	16 9	—
" weavers, 1 loom	—	—	—	—	—	—	—
" " 2 looms	—	—	—	—	—	—	—
" " 3	—	—	—	—	—	—	—
" " 4	—	—	—	—	—	—	—
" " average	—	—	7 —	7 3, 8 9	8 3, 10 9	6 9	—
Tappers.....	14 —	—	—	—	—	—	—
Calenderers.....	15 —	—	—	—	—	—	—
Sizers, dressers, &c.	18 10	—	—	32 —	40 —	17 —	—
Card minders	—	—	—	—	—	—	—
Foremen mechanics.....	—	—	—	—	—	—	24 —
Engineers.....	—	—	—	—	—	—	—
Mechanics and millwrights ...	—	—	—	24 —	27 —	18 —	21 —
Blacksmiths	—	—	—	—	—	21 —	—
Joiners	—	—	—	—	—	—	21 —
Firemen	—	—	—	—	—	—	14 —
Labourers	—	—	—	12 —	17 —	—	12 —
Average of all	—	—	—	—	—	—	—

TABLE 30 *Contd.*—SCOTLAND. *Average earnings of cotton operatives.*

Year	1856.	1857.	1858.	1858.	1859-60.	1860.	1860.
Place	Glas- gow.	Glas- gow.	Glas- gow.	Glas- gow.	Glasgow.	?	
Authority.....	3.	3.	56.	3.	3.	20a.	20b.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutchers overlookers	—	—	—	—	—	—	15 6
Carding masters	24 ¹ / ₂ , 36 ¹ / ₂	24 ¹ / ₂ , 36 ¹ / ₂	—	24 ¹ / ₂ , 36 ¹ / ₂	24 ¹ / ₂ , 36 ¹ / ₂	—	26 —
Pickers	—	—	—	—	—	5 10	—
Mixers	—	—	—	—	—	—	12 —
Scutchers	—	—	—	—	—	—	—
Strippers	—	—	—	—	—	—	12 —
Grinders	—	—	—	—	—	10 10	12 —
Drawing frame tenters	—	—	—	—	—	6 8	—
Slubbing frame tenters	—	—	—	—	—	—	—
Intermediate frame tenters ..	—	—	—	—	—	—	—
Roving frame tenters	—	—	—	—	—	—	—
All tenters, average	9 —	9 —	—	9 —	9 ¹ / ₂ , 10 ¹ / ₂	—	6 5
Little tenters	3 ¹ / ₂ , 4 6	3 ¹ / ₂ , 4 6	—	3 ¹ / ₂ , 4 6	3 ¹ / ₂ , 4 6	—	—
Stretchers	—	—	—	—	—	—	—
Spinning overlookers	24 ¹ / ₂ , 39 ¹ / ₂	24 ¹ / ₂ , 39 ¹ / ₂	—	24 ¹ / ₂ , 39 ¹ / ₂	24 ¹ / ₂ , 39 ¹ / ₂	—	—
Self-acting overlookers	21 —	21 —	—	21 —	21 ¹ / ₂ , 27 ¹ / ₂	—	25 —
Spinners, 1st class	39 —	39 —	—	39 —	33 ¹ / ₂ , 39 ¹ / ₂	—	—
" 2nd "	33 —	33 —	—	33 —	27 ¹ / ₂ , 33 ¹ / ₂	—	—
" 3rd "	18 —	13 —	—	18 —	18 ¹ / ₂ , 21 ¹ / ₂	—	—
" women	—	—	—	—	—	8 —	6 9
" average	—	—	27 —	—	—	—	—
Piecers, 1st class	10 —	10 —	—	10 —	9 ¹ / ₂ , 10 ¹ / ₂	—	—
" 2nd "	9 —	9 —	—	9 —	7 6, 9 ¹ / ₂	—	—
" 3rd "	8 —	9 —	—	9 —	4 6, 8 ¹ / ₂	—	—
" average	—	—	—	—	—	—	4 —
Throstle spinners, W	—	—	—	—	—	—	—
" " G	—	—	—	—	—	—	—
" " Average	—	—	—	—	—	4 9	—
Reelers overlookers	—	—	—	—	—	—	17 —
"	—	—	—	—	—	—	4 6
Winders	8 —	7 6	9 —	8 —	9 —	—	—
Warpers, M.	—	—	16 6	—	—	—	—
" W.	—	—	—	—	—	—	—
Hand loom warpers	22 —	18 —	—	17 —	18 —	—	—
Twisters-in	—	—	12 —	—	—	—	—
Power loom overlookers	30 —	30 —	38 —	30 —	30 ¹ / ₂ , 36 ¹ / ₂	19 9	—
" weavers, 1 loom	—	—	—	—	—	—	—
" " 2 looms	—	—	—	—	—	—	—
" " 3 "	—	—	—	—	—	—	—
" " 4 "	—	—	—	—	—	—	—
" " average	8 6, 11 ¹ / ₂	8 6, 11 ¹ / ₂	9 9	8 6, 11 ¹ / ₂	{ 8 ³ / ₄ , 10 ¹ / ₂ , 11 ¹ / ₂ }	7 3	—
Tappers	—	—	—	—	—	—	—
Calenderers	—	—	—	—	—	—	—
Sizers, dressers, &c.	32 —	32 —	35 —	32 —	32 ¹ / ₂ , 36 ¹ / ₂	20 —	—
Card minders	—	—	—	—	—	—	—
Foremen mechanics	—	—	—	—	—	—	25 —
Engineers	{ 25 ¹ / ₂ , 30 ¹ / ₂ , 30 ¹ / ₂ }	{ 25 ¹ / ₂ , 30 ¹ / ₂ , 30 ¹ / ₂ }	{ — }	{ 25 ¹ / ₂ , 30 ¹ / ₂ , 30 ¹ / ₂ }	{ 25 ¹ / ₂ , 30 ¹ / ₂ , 30 ¹ / ₂ }	{ — }	—
Mechanics and millwrights ...	24 ¹ / ₂ , 25 ¹ / ₂	24 ¹ / ₂ , 25 ¹ / ₂	26 —	24 ¹ / ₂ , 25 ¹ / ₂	24 ¹ / ₂ , 27 ¹ / ₂	18 —	22 6
Blacksmiths	—	—	—	—	—	19 —	—
Joiners	—	—	—	—	—	—	20 —
Firemen	—	—	—	—	—	—	15 3
Labourers	—	—	15 —	—	—	—	13 —
Average of all	—	—	—	—	—	—	—

TABLE 30 *Contd.*—SCOTLAND. *Average earnings of cotton operatives.*

Year	1861.	1863.	1866.			1870.	1870.
Place	Glasgow.	Glasgow.	Glasgow. Proportionate numbers.			?	?
Authority.....	3.	5.	a.	b.	3.	20a.	20b.
	s. d.	s. d.			s. d.	s. d.	s. d.
Scutchers overlookers	—	—	—	—	—	—	16 6
Carding masters	24/-, 36/-	30 -	0.55	0.33	27 -	—	30 -
Pickers	—	—	—	—	—	6 8	—
Mixers	—	—	—	—	—	—	13 -
Scutchers.....	—	—	1.44	1.25	8 7	—	—
Strippers	—	—	—	0.65	11 6 W.	—	14 -
Grinders	—	—	1.44	0.76	19 6	12 4	14 -
Drawing frame tenters	—	—	1.22	1.20	10 -	9 1	—
Slubbing frame tenters	—	—	5.22	9.59	10 -	—	—
Intermediate frame tenters ..	—	—	—	—	—	—	—
Roving frame tenters	—	—	—	—	—	—	—
All tenters, average	9 -, 10/-	10 -	—	—	—	—	7 -
Little tenters	3 -, 4 6	3 -, 4 6	5.9	—	5 9	—	—
Stretchers	—	—	—	—	—	—	—
Spinning overlookers	24/-, 39/-	24 -, 39/-	—	—	—	—	—
Self-acting overlookers	21 -, 25 6	22 -	0.45	0.38	27 -	—	23 -
Spinners, 1st class	30 -, 39/-	32 -	—	—	26 -	—	—
" 2nd	27 -, 33 -	27 -, 30/-	2.33	3.98	19 6 W.	—	—
" 3rd	18 -, 21 -	18 -, 21 -	0.33	—	19 - W.	—	—
" women	—	—	—	—	—	10 3	7 8
" average.....	—	—	—	—	—	—	—
Piecers, 1st class	9 -, 10 6	10 -	5.33	6.81	13 6	—	—
" 2nd	7 6, 9 -	9 -	—	—	—	—	—
" 3rd	4 6, 8/-	4 6, 8/-	3.55	3.98	6 -	—	5 6
" average	—	—	—	—	—	—	—
Throstle spinners. W.....	—	—	4 78	1.96	9 6	—	—
" G.....	—	—	2.55	—	6 -	—	—
" Average	—	—	—	—	—	6 8	—
Reelers overlookers	—	—	—	—	—	—	17 6
"	—	—	7.03	4.79	10 6	—	4 8
Winders	9 -	6 -	5.44	3.92	9 -, 10/-	—	—
Warpers. M.....	—	—	1.55	1.14	22 -	—	—
" W.	—	—			14 -	—	—
Hand loom warpers	18 -	16 -	—	—	21 -	—	—
Twisters-in	—	—	1.00	0.22	20 -, 9 6 (5)	—	—
Power loom overlookers	30/-, 34/-	28 -	1.12	—	45 -	27 1	—
" weavers, 1 loom	—	—	—	—	—	—	—
" " 2 looms	—	—	—	—	—	—	—
" " 3	—	—	—	—	—	—	—
" " 4	—	—	—	—	—	—	—
" " average..	8 6, 11/-	9 -, 10/-	—	—	—	9 4	—
Tappers	—	—	—	—	—	—	—
Calenderers	—	—	—	—	—	—	—
Sizers, dressers, &c.	30/-, 36/-	28 -	0.33	0.49	33 -, 35/-	21 -	—
Card minders	—	—	2.78	1.20	7 -	—	—
Foremen mechanics.....	—	—	—	—	—	—	35 -
Engineers	{ 25 -, 30 -, 30 - }	—	0.11	0.16	24 -, 40/-	—	—
Mechanics and millwrights ..	24 -, 27/-	24 -	2.12	—	27 -	19 -	25 -
Blacksmiths	—	—	—	—	—	18 -	—
Joiners	—	—	—	—	—	—	25 -
Firemen	—	—	0.33	0.33	20 6	—	15 -
Labourers.....	—	—	—	—	—	—	15 -
Average of all.....	—	—	—	—	—	—	—

TABLE 30 *Contd.*—SCOTLAND. *Average earnings of cotton operatives.*

Year	1871.	1871.	1874.	1875.	1883.	1875.	1884.
Place	Ayrshire.	Glasgow.	?	?	?	?	?
Authority	9.	9.	20b.	20a.	20a.	20b.	20b.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Scutchers overlookers	—	—	16 6	—	—	17 —	19 —
Carding masters	—	—	30 —	—	—	30 —	30 —
Pickers	—	—	—	7 10	7 —	—	—
Mixers	—	—	15 —	—	—	15 6	15 6
Scutchers	—	—	—	—	—	—	—
Strippers	—	18 —	16 —	—	—	16 —	16 —
Grinders	—	18 —	16 —	15 1	14 —	16 —	16 —
Drawing frame tenters	—	—	—	9 4	8 5	—	—
Slubbing frame tenters	—	—	—	—	—	—	—
Intermediate frame tenters	—	—	—	—	—	—	—
Roving frame tenters	—	7 —	—	—	—	—	—
All tenters, average	8 —	—	8 8	—	—	8 8	8 4
Little tenters	—	5 6, 6 6	—	—	—	—	—
Stretchers	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—
Self-acting overlookers	—	—	30 —	—	—	30 —	31 —
Spinners, 1st class	—	—	—	—	—	—	—
" 2nd "	—	—	—	—	—	—	—
" 3rd "	—	—	—	—	—	—	—
" women	6/-, 12/-	—	8 6	11 8	9 4	8 6	9 —
" average	—	29/-, 50/-	—	—	—	—	—
Pickers, 1st class	—	10 —	—	—	—	—	—
" 2nd "	—	6 6	—	—	—	—	—
" 3rd "	—	—	—	—	—	—	—
" average	—	—	6 6	—	—	6 6	7 —
Throstle spinners. W.	—	—	—	—	—	—	—
" " G.	—	—	—	—	—	—	—
" " Average	—	—	—	8 10	7 5	—	—
Reelers overlookers	—	—	23 —	—	—	23 —	23 —
"	—	—	6 3	—	—	5 5	7 5
Winders	—	—	—	—	—	—	—
Warpers. M.	—	—	—	—	—	—	—
" W.	—	—	—	—	—	—	—
Hand loom warpers	—	—	—	—	—	—	—
Twisters-in	—	—	—	—	—	—	—
Power loom overlookers	—	—	—	27 2	24 2	—	—
" weavers, 1 loom	—	—	—	—	—	—	—
" " 2 looms	—	—	—	—	—	—	—
" " 3 "	—	—	—	—	—	—	—
" " 4 "	—	—	—	—	—	—	—
" " average	9 —	—	—	10 2	9 2	—	—
Tappers	—	—	—	—	—	—	—
Calenderers	—	—	—	—	—	—	—
Sizers, dressers, &c.	20/-, 30/-	—	—	24 —	22 —	—	—
Card minders	—	—	—	—	—	—	—
Foremen mechanics	—	—	40 —	—	—	40 —	50 —
Engineers	—	—	—	—	—	—	—
Mechanics and millwrights ..	20/-, 28/-	—	28 —	22 —	20 —	25 6	25 6
Blacksmiths	—	—	—	24 —	21 6	—	—
Joiners	—	—	29 9	—	—	27 9	28 —
Firemen	—	—	21 —	—	—	21 —	21 6
Labourers	12/-, 16/-	—	17 —	—	—	17 —	18 —
Average of all	—	—	—	—	—	—	—

TABLE 30 *Contd.*—SCOTLAND. *Average earnings of cotton operatives.*

Year	1886.		1891.	1891.	1891.	1891.	1906.	
Place	Scotland.		Lanark	Glasgow.	Glasgow.	Johnstone.	Scotland.	
Authority.....	1.		7a.	7b.	7c.	7d.	2.	
	No.	Wages.					No.	Wages.
		s. d.	s. d.	s. d.	s. d.	s. d.		s. d.
Scutchers overlookers.....	—	—	—	—	—	—	—	—
Carding masters	13	27 5	—	36	36½, 40½	—	—	—
Pickers	—	—	—	—	—	—	—	—
Mixers	5	7 10 W.	—	—	—	8 3	—	—
Scutchers.....	13	9 6 W.	—	—	—	—	—	—
Strippers	17	18 1	—	—	—	—	—	—
Grinders	—	—	—	—	—	—	—	—
Drawing frame tenters	32	8 9	9	—	—	—	23	13 10
Slubbing frame tenters	—	—	11	—	—	—	23	14 4
Intermediate frame tenters	111	10 1	—	—	—	—	31	12 5
Roving frame tenters	—	—	11	—	—	—	72	11 10
All tenters, average	143	9 9	—	12 9	12	6½, 12½	149	12 8
Little tenters	42	5 11	—	—	—	—	—	—
Stretchers	—	—	—	—	—	—	—	—
Spinning overlookers	—	—	—	—	—	—	—	—
Self-acting overlookers	12	24 9	—	—	—	—	—	—
Spinners, 1st class.....	—	—	—	—	—	—	—	—
" 2nd	—	—	—	—	—	—	—	—
" 3rd	—	—	—	—	—	—	—	—
" women	—	—	10	14 9	14 6	8½, 12½	—	—
" average.....	22	25 5	—	—	—	—	—	—
Piecers, 1st class	194	10 2	—	—	—	—	—	—
" 2nd	—	—	—	—	—	—	—	—
" 3rd	156	6 6	—	—	—	—	—	—
" average.....	350	8 6	—	—	—	—	—	—
Throstle spinners. W.	98	9 10	—	—	—	—	98	10 9
" " G.	23	6 6	—	—	—	—	—	—
" " Average ..	121	9 3	—	—	—	—	—	—
Reelers overlookers	4	23 9	—	—	—	—	—	—
"	48	9 5	8½, 13½	—	—	—	110	12 6
Winders	904	9 2	12½, 14½	—	—	10½, 12½ (6)	473	11 10
Warpers. M.	45	28 6	—	—	—	—	—	—
" W.	30	14 9	—	—	—	—	49	15 4
Hand loom warpers	—	—	—	—	—	—	—	—
Twisters-in	67	25 10	—	—	—	—	—	—
Power loom overlookers	101	42 6	—	—	—	—	60	44 10
" weavers, 1 loom	40	3 11	—	—	—	—	—	—
" " 2 looms	2,512	10 6	—	—	—	—	1,074	13
" " 3 "	560	13 2	—	—	—	—	242	12 8
" " 4 "	—	—	—	—	—	—	—	—
" " average	3,112	10 11	14	—	—	10½, 12½ (6)	1,316	12 11
Tappers.....	—	—	—	—	—	—	—	—
Calenderers	—	—	—	—	—	—	—	—
Sizers, dressers, &c.	47	43 1	—	—	—	—	—	—
Card minders	—	—	—	—	—	—	—	—
Foremen mechanics.....	—	—	—	—	—	—	—	—
Engineers	18	28 3	—	—	—	—	26	26
Mechanics and millwrights ..	56	28 11	—	—	—	—	32	32
Blacksmiths	—	—	—	—	—	—	—	—
Joiners	9	27	—	—	—	—	—	—
Firemen	10	20 1	—	—	—	—	—	—
Labourers.....	6	17	—	—	—	—	18	18 4
Average of all	5,974	12 3	—	—	—	—	4,028	14 9

Notes to Table 30.

(1) 1810, 21s.; 1811, 19s. 6d.; 1812, 20s.; 1813-15, 21s.; 1816-18, 18s.; 1819, 15s.; 1831, 16s. 6d. The calenderers are given as 15s., 1810-18, and 14s. in 1819.

(2) Cardroom children.

(3) Doubtful if men or women, or whether power or hand loom.

(4) Females in a large mill. Children, 1s. to 1s. 6d.

(5) Twisters, men, 20s. Drawers, women, 9s. 6d.

(6) At Kilmarnock, in another mill, same authority.

** From the Royal Commission on Hand-loom Weavers, 1838.

In 1833 a very detailed census, with the averages grouped according to sex and age, was taken, and is recorded by Ure and in the "Returns of Wages," 1886. It applied only to Glasgow, and included 4,261 males at 11s. 9½*d.* and 7,445 females at 5s. 9¼*d.*, the average of all being 7s. 11¾*d.* The wage census results of 1886 and 1906 are, for Scotland:—

	1886.		1906.	
	Numbers.	Wage. <i>s. d.</i>	Numbers.	Wage. <i>s. d.</i>
Men	647	29 9	666	30 11
Lads and boys	188	8 9	159	9 5
Women	3,825	10 11	2,543	12 9
Girls	1,314	7 10	660	7 5
All	5,974	12 3	4,028	14 9

Macculloch gives, for 1845,¹ 8s. to 9s. as the average for all workers in weaving and spinning at Glasgow. It is doubtful how much the inclusion of the other Scottish centres, as Lanark, Johnstone, Paisley, &c., would affect the figures given by Ure and Macculloch as representing all Scotland. Judging by those given for Lanark in 1833 in Table 30 (David Dale and Robert Owen's mill, to which also the 1891 figures refer), the effect would not be great, but would slightly lower the average.

To find our intermediate figures, we have not only the records given in the table, but some miscellaneous information of varying value which does not lend itself to tabulation. In the Returns of Wages we learn that wages had not varied much for several years previous to 1831, and this is borne out by our tabulated statements. On the whole there was probably a reduction, but it does not appear to have been great, and mainly affected mule-spinners. Before the Commission on Artisans and Machinery (1824) a master stated that the wages of spinners was 25s., but the operatives stated them as 23s. to 24s. The employers stated them as having been 30s. in 1819-20, and the men as 26s. or 27s. This is evidence of a reduction of some 3s. to 5s. between 1820 and 1824. In 1837 a great strike of spinners took place, which was unsuccessful in averting a threatened reduction. A considerable amount of evidence was taken about this strike by the Select Committee on Combinations of Workmen, 1838, and the main purport is reproduced in the following paragraphs:—

A master.—Spinners, average 20s. to 26s. or 27s., and vary even up to 40s. An advance took place in 1836, amounting to 13, 15, or 16 per cent. Then came a reduction of 16 per cent., and another of 30 per cent., making 46 per cent. in all. The hours worked were 69.

Another master.—His reduction amounted to 25 per cent. on the autumn of 1836.

¹ *Statistical Account of the British Empire*, p. 694.

An operative.—The reduction is about one-half of the wages of 1836.

Another operative.—In 1824 a strike took place. In 1826 a reduction of 15 per cent. and 7 per cent., equalling 22 or 23 per cent. From 1827 to 1836 there was no rise; in 1836 one took place. There had been changes in machinery, and the earnings had not fallen to so great an extent as prices had. The earnings before the advance in 1836 were 22s. to 25s.; after, 27s. for half the men. The reductions in 1837 equalled 57 to 58½ per cent. on the gross wages. There were 900 to 1,000 spinners in Glasgow. None earned 40s.; one in seven or eight earned 35s.; the average was 21s. or 22s., made up of one in eight at 35s., a second class at 24s. or 25s., and the lowest at 12s. to 16s.

Another spinner.—His average after the reduction was 40s. gross, less 13s. 6d. to piecers, leaving 27s. 6d. (*sic*) less 2s. 6d. or 3s. for odd piecing. Considered his average 25s. This was spinning on a pair of mules. On a double pair he earned 75s., less 25 per cent., equal 56s. 3d., less 25s. 6d. for piecing, leaving 30s. 9d. net. Piecers' wages were 7s. highest, and 2s. 6d. or 3s. lowest, the averages being: big, or outside, 6s. 3d.; inside, 4s. 6d.; little, 2s. 6d. There had been no advance in spinners' rates between 1812-14 and 1836.

The historian Alison also gave evidence about this strike, and he estimated the average wages of spinners at 24s. or 25s., thus substantiating the operatives. He estimated the loss in wages by the strike to have fallen on 800 spinners at 30s., 2,400 piecers at 4s., and 2,400 card and picking-room hands at 8s. This does not agree with the rest of his evidence, but it indicates how difficult the question of spinners' average earnings is. In connection with this evidence, the *Edinburgh Review*, in 1838 (p. 238), states that the spinners' wages were 30s. to 35s. early in 1836, were 35s. to 42s. later, and after the reduction of 1837 became 26s. to 36s. This is very *ex parte* evidence, however, and quite unreliable.

There were many women spinners employed in Glasgow at this time, and throughout the century. Professor Chapman² says that in 1837, shortly after the strike, there were as many women spinners as men, the women winding mules of 250 spindles only. Mr. Henderson gives a record of the wages of women spinners (see Table 30, cols. marked 20*b*), but the wage census of 1886 does not mention them. It does show, however, 194 young women piecers, and only 22 men spinners, indicating probably that the men were more nearly overseers, superintending the work of women spinners. In 1906 there are no spinners' or piecers' wages recorded in the wage census.

In 1883 Mr. Henderson, the Factory Inspector, estimated the average wage of mule spinners (men) in Scotland as 28s.

A witness to the Glasgow (Municipal) Housing Commission stated that in a Glasgow cotton spinning factory the average wage had advanced by 25 per cent. between 1870 and 1902.

² *Lancashire Cotton Industry*, p. 14.

The figures for calenderers from 1810 to 1838 may be compared with the following, embodied in agreements between the operatives and employers:—1890-1900, 28s.; 1901-05, 29s.; 1906-09, 30s.

Miss Margaret Irwin, one of the lady commissioners of the Labour Commission, in her report, from which the tabulated statements for 1892 are taken, stated the average wages of weavers in various Glasgow mills to have been:—

		s.	d.	
Mill (1).....	1892	13	2	per weaver, 6s. 7d. per loom.
" (2).....	'92	13	10	" 6s. 11d. "
" (3).....	'92	14	11	" for 5 weavers, but
" (4).....	'92	13	11	" the mill.
" (6).....	'92	11	8½	"
" (7).....	'92	14	—	" 7s. 6d. per loom.
" (8).....	'92	13	—	" 6s. 6d. "
	'87	14	—	"
	'88	12	9½	" for six months.
	'88	13	6½	"
	'89	11	10	"
	'89	12	9½	"
	'90	13	4	"
	'90	10	6½	"
	'91	11	7	"
	'91	12	—	"

Assuming that the average of 8s. given by Ure in 1833 for Glasgow is typical of the whole of Scotland, and comparing it with the average for Scotland for the wage census of 1886, 12s. 3d., and 1906, 14s. 9d., we get the following index-numbers representing the changes in average wages of cotton factory operatives from 1833 to 1906:—

TABLE 31.—Percentage variations in wages of cotton factory operatives in Scotland, 1833-1906. 1886 = 100.

1833	65½	1860	73½	1883	96¾
'40-41	59¾	'63-64	69¾	'86	100
'45	69½	'66	79¾	'91	114½
'49-50	61	'70	86½	1906	120½
'55	70	'74	99½		

Hand-loom weavers.

We have a large quantity of material relating to hand-loom weavers, mainly recorded in the Committee of 1835 and the Commission of 1838-40, and all the records agree that an extraordinary fall in prices paid and amounts earned took place between the early years of the century and 1830-40. Here, however, the agreement practically ends, and it is difficult to arrive at a series of numbers representing the course of average earnings which can be put forward with any certainty.

We have several consecutive lists of piece prices for the same description of work throughout, we have also other lists of average earnings or estimates of probable earnings; but, while we do not hear of any changes in condition which would augment the weavers'

earnings in a given space of time, the changes in prices are not reflected too faithfully in changes in earnings. As prices fell the weaver lengthened his or her working week, so that the course of prices is not in itself sufficient. On the other hand, the earnings stated usually leave us in doubt whether they are gross, out of which the rent of the loom and the cost of winding had to be paid, or net after these charges were met.

In 1769, when Arthur Young took his northern tour, and before Arkwright's inventions in spinning had brought the enormous increase in the supplies of yarn, wages of hand-loom weavers were not high. For Manchester, Young gives quite a long list, and the lowest earnings of men recorded by him are 3s. per week, the highest 12s. Apparently, 5s. 6d. to 7s. would be the average. At Mellor, according to Radcliffe,³ about 1770, the cottagers were entirely employed at spinning and weaving except at harvest, the father earning 8s. to 10s. 6d. and his sons 6s. to 8s. per week. "The great sheet-anchor of the cottages and small farms" was the hand-wheel, as it required six or eight hands to spin enough cotton, flax, or wool to suffice for one weaver. Between 1770 and 1778 the conditions became completely changed. Cotton became the universal material, hand-wheels were thrown into the lumber room, the spinning was done on common jennies, and the carding on carding engines for all degrees of fineness up to 60's or 80's counts. The enhanced supply of yarn and its increasing cheapness brought a demand for weavers which for years was never fully met. From 1788 to 1803 was the golden age of hand-loom weaving. "The old loom shops being insufficient," says Radcliffe, "every lumber room, even old barns, earhouses, and outbuildings of any description were repaired, windows broken through old blank walls, and all fitted up for loom shops. The price of labour . . . rose to five times the amount ever before experienced in this district [Mellor], every family bringing home 40, 60, 80, 100, and even 120 shillings per week." We should expect from this that contemporary statements would show very high wages during this period, and this they do. In 1792, for instance, a Bolton weaver was paid 3s. per yard for an article of which he could weave 20 yards a week, but would have to pay something, presumably, for loom rent and winding. Another Bolton record shows 29s. in 1797 and 30s. in 1798 as the earnings per week. A very large amount of information is obviously required if we would attempt the computation of an average wage for hand-loom weavers in this period. This material we do not possess, but in each year from 1790 onwards our information increases, until from 1810 we have no dearth of material, and our main difficulty lies in its apparent contradictions. We are, of course, mainly concerned with the period after 1806, for this is the start of our information regarding factory operatives.

Such long series of statements as we can procure are given in Tables 32 and 33. These tables contain both statements of piece prices and either estimates of actual earnings or records actually taken from wages books. On the whole, the weekly wages seem to

³ *Origin of the system of power-loom weaving.*

be records of actual earnings, but some, notably the weavers of pullicates at Glasgow, are almost certainly estimates based on the piece-rates paid. This accounts in some measure for the discrepancies in the figures.

The number of hand-loom weavers exceeded the numbers employed in factories until quite a late date, probably until 1833. The course of their wages is totally unlike that of factory operatives, and we need therefore to examine the evidence at some length before arriving at a final estimate.

Notes to Tables.

(a.) A classic list. Quoted from Gaskell, *Artizans and Machinery*, given also by Porter and others. The rent of 4 looms in 1797-1803, 9*l.*; 1804-17, 8*l.*; 1818-34, 7*l.*; and of 2 looms, 1797-1803, 5*l.* 10*s.*; 1804-17, 6*l.*; 1818-34, 5*l.* 10*s.*

(b.) Prices for weaving "20⁰ $\frac{9}{8}$ jaconet, 46 in., 135 shots per inch. In 1792-1817, less 6*d.*; 1818-25, less 2 $\frac{1}{2}$ *d.*; 1831-38, less 1*d.* From the Hand-loom Weavers' Commission, 1838-40.

(c.) Price for weaving bed quilts. Three quilts were a week's work. (Select Committee on Manufactures, Commerce and Shipping, 1833.)

(d.) Prices per yard. In 1792, 20 yards was said to have been a week's work; in 1824, 24 yards. The earnings were said to have been, in 1818, 6*s.* to 7*s.* clear; in 1824, 5*s.* 6*d.* clear and 2*s.* to 3*s.* by the wife. (*Artizans and Machinery*, 1824.)

(e.) Prices per yard. The earnings were said to have been 20*s.* in 1800, and 7*s.* for self and 4*s.* for wife in 1824. (*Ibid.*)

The discrepancies between (d) and (e) are characteristic of these hand-loom weavers' wages records.

(f.) From the "Returns of Wages," 1886.

(g.) From Rooke, *National Wealth* for 1798-1823, and for Carlisle from the Hand-loom Weavers' Commission, 1838-40, for 1824-38. Eden, *State of the Poor*, gives for Wetherall, in Cumberland, circa 1795—weaver 7*s.* to 8*s.*, girl and wife, winding 2*s.* 6*d.*; and another, weaver, 21*l.*, wife, 8*l.* For Carlisle he gives, generally, 8*s.* to 9*s.* 6*d.*, some 12*s.* to 15*s.*

(h.) From Porter. This should be compared with column 3 of Table 33 below. I cannot trace the source of the differences. Porter is usually correct, but in this case Maxwell's figures seem best.

(i, j, k, l.) From the Hand-loom Weavers' Commission, 1838-40. (i) and (k) are for inferior weavers on inferior work. (j) and (l) are for skilled weavers on best work. J. C. Symonds was the Commissioner, and he says these are net wages, collated from various manufacturers' books.

(m.) From the same source. The weekly wages are obviously calculated from the piece price, which is per ell.

(n.) *Ibid.* The weavers worked at "harness" looms, and were highly skilled. The wages are for 72 hours, 1810-25; 73 hours, 1826-31; and 74 hours, 1835-38.

(o.) From Strang, *Statistical Journal*, 1858, who continues:—

1818.	1851.	1852.	1853.	1856.	1857.	1858.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
6 -	5 9	6 9	7 -	7 -	6 4	5 9

The Returns of Wages gives the following for Glasgow:—

	1856.	1857.	1858.	1859-60.	1861.	1863.	1866.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Cotton.....	10 6	9 -	9 6	8 -	8 -	7 -	} Men 12s. to 20s.; women 9s.
Mixed fabrics....	15 -	14 -	14 -	13 -	13 -	10 6	

(p.) From Hand-loom Weavers' Commission, 1838-40. The prices are per ell. Wages in 1838:—1st class, 6s. 8d.; 2nd class, 4s. 8d.; old and children, 3s. 2d. In 1800 the earnings were 20s.; in 1838, 8s. on another class of work.

(q.) *Ibid.* In 1838, very fine 7s. 6d., 8s.; ordinary, 1st class 5s. 7½d., 2nd class 4s. 3d.; "harness" weavers 6s. 6d. The wages in the table are net.

TABLE 32.—Wages of hand-loom weavers. 1792-1838.

Place.	Notes.*	1792.	1793.	1794.	1795.	1796.	1797.	1798.	1799.	1800.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bolton	Wages (a)	—	—	—	—	—	29 -	30 -	25 -	25 -
" jaconet	Prices (b)	2 8	—	—	—	—	—	—	—	1 11
" quilts	" (c)	—	—	—	—	—	—	—	—	—
"	" (d)	3 -	2 -	1 9	1 9	1 9	1 6	1 3	1 2	1 2
"	" (e)	—	—	—	—	—	—	—	—	1 2
Manchester, nankeens.....	Wages (f)	—	—	—	—	—	—	—	—	—
" cambrics, 60-reed ..	" (f)	—	—	—	—	—	—	—	—	—
" .. 80 ..	" (f)	—	—	—	—	—	—	—	—	—
" quiltings, 36 ..	" (f)	—	—	—	—	—	—	—	—	—
" .. fine ..	" (f)	—	—	—	—	—	—	—	—	—
Wigton, Cumberland	" (g)	—	—	—	—	—	—	13 -	14 -	15 -
Glasgow	" (h)	—	—	—	—	—	—	—	—	13 1
" gingham	" (i)	—	—	—	—	—	—	—	—	—
" pulicates	" (j)	—	—	—	—	—	—	—	—	—
" plain muslins	" (k)	—	—	—	—	—	—	—	—	—
" ..	" (l)	—	—	—	—	—	—	—	—	—
" pulicates	Prices (m)	—	—	—	—	—	—	—	—	—
" ..	Wages (n)	—	—	—	—	—	—	—	—	—
" shawls.....	" (n)	—	—	—	—	—	—	—	—	—
" ..	" (o)	—	—	—	—	—	—	—	—	—
Perth, pulicates	Prices (p)	—	—	—	—	—	—	—	—	—
Lanark	Wages (q)	—	—	—	21 -	—	—	—	—	18 6

Place.	Notes.*	1801.	1802.	1803.	1804.	1805.	1806.	1807.	1808.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bolton	Wages (a)	25 -	29 -	24 -	24 -	25 -	22 -	18 -	15 -
" jaconet	Prices (b)	—	—	—	—	—	—	1 8	—
" quilts	" (c)	—	—	—	—	—	—	—	—
"	" (d)	1 2	1 4	- 11	- 11	- 9	- 8	- 7	- 6½
"	" (e)	—	—	—	—	- 11	—	—	—
Manchester, nankeens.....	Wages (f)	—	—	—	—	—	—	—	—
" cambrics, 60-reed ..	" (f)	—	—	—	—	—	—	—	—
" .. 80 ..	" (f)	—	—	—	—	—	—	—	—
" quiltings, 36 ..	" (f)	—	—	—	—	—	—	—	—
" .. fine ..	" (f)	—	—	—	—	—	—	—	—
Wigton, Cumberland	" (g)	16 -	17 -	19 -	21 -	23 -	22 -	19 6	14 -
Glasgow	" (h)	—	—	—	—	15 4	17 8	15 6	13 2
" gingham	" (i)	—	—	—	—	—	—	—	—
" pulicates	" (j)	—	—	—	—	—	—	—	—
" plain muslins	" (k)	—	—	—	—	—	—	—	—
" ..	" (l)	—	—	—	—	—	—	—	—
" pulicates	Prices (m)	—	—	—	—	—	1 3	1 -	- 11
" ..	Wages (n)	—	—	—	—	—	32 6	25 9	23 -
" shawls.....	" (n)	—	—	—	—	—	—	—	—
" ..	" (o)	—	—	—	—	—	—	—	—
Perth, pulicates	Prices (p)	- 4	—	- 3½	—	—	—	—	- 4
Lanark	Wages (q)	—	26 6	—	—	21 -	—	16/6, 13/6	14 9

* See text, p. 427.

TABLE 32 *Contd.*—Wages of hand-loom weavers. 1792-1838.

Place.	Notes.*	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.
		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Bolton	Wages (a)	16 -	19 6	14 -	14 -	15 -	24 -	14 -	12 -
„ jaconet	Prices (b)	—	—	1 6	—	—	—	—	—
„ quilts	„ (c)	—	—	—	—	—	11 -	11 -	10 -
„	„ (d)	- 6	- 10	- 6	- 6½	- 10	- 10	- 6	- 4
„	„ (e)	—	—	—	—	—	—	1 1	—
Manchester, nankeens.....	Wages (f)	—	16 3	12 6	13 -	12 6	15 7	13 2	13 2
„ cambrics, 60-reed	„ (f)	—	16 10½	9 -	9 5	10 8	15 4	10 5	8 4
„ 80 „	„ (f)	—	14 -	10 9	10 3	11 1	16 9	10 3	8 3
„ quiltings, 36 „	„ (f)	—	16 5½	12 7	9 6	11 5	15 -	13 -	11 11
„ fine „	„ (f)	—	17 2	14 9	14 -	14 -	18 -	18 3	15 6
Wigton, Cumberland	„ (g)	8 11	10 10	7 3	9 6	12 2	13 1	11 6	7 7
Glasgow	„ (h)	11 9	11 6	7 6	9 9	12 1½	13 -	11 6	5 6
„ gingham	„ (i)	—	—	—	—	1810-16	17 -	—	—
„ pulicates	„ (j)	—	—	—	—	—	24 6	—	—
„ plain muslins	„ (k)	—	—	—	—	—	13 6	—	—
„ „	„ (l)	—	—	—	—	—	17 2	—	—
„ pulicates	Prices (m)	- 10	1 -½	- 9	1 -	- 11½	1 -½	1 -	- 6
„ „	Wages (m)	21 3	26 9	18 -	25 9	24 9	26 9	25 9	12 3
„ shawls.....	„ (n)	—	—	—	—	20 -	—	—	—
Perth, pulicates	„ (o)	—	—	—	—	—	—	—	—
„ pulicates	Prices (p)	- 4½	- 2½	—	- 3½	- 4	—	—	3½d., 1½d.
Lanark	„ (q)	17 6	16 -	11 -	9 9	11 -	—	—	—

Place.	Notes.*	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.
		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Bolton	Wages (a)	9 -	9 -	9 6	9 -	8 6	8 6	8 6	8 6
„ jaconet	Prices (b)	—	—	—	—	—	—	—	—
„ quilts	„ (c)	7 6	7 6	7 6	7 6	7 6	6 6	6 -	6 -
„	„ (d)	- 4½	- 5½	- 4	- 4½	- 4½	- 4½	- 4½	- 4½
„	„ (e)	—	—	—	—	—	—	—	—
Manchester, nankeens.....	Wages (f)	9 6	9 6	9 6	11 -	11 -	11 -	6 6	6 6
„ cambrics, 60-reed	„ (f)	6 4	8 -	7 8	7 5	7 -	6 9	7 -	7 -
„ 80 „	„ (f)	6 9	8 10	7 9	7 6	7 3	7 -	7 6	7 6
„ quiltings, 36 „	„ (f)	9 8	9 8	9 8	8 6	11 6	10 -	7 -	7 -
„ fine „	„ (f)	11 1	11 -	11 3	10 -	11 6	10 -	9 -	9 -
Wigton, Cumberland	„ (g)	7 1	8 3	7 -	6 6	6 6	7 -	7 -	7 -
Glasgow	„ (h)	5 9	6 6	5 -	—	—	—	—	—
„ gingham	„ (i)	—	10 -	—	—	9 6	9 6	9 6	9 6
„ pulicates	„ (j)	—	13 5	—	—	12 2	12 2	12 2	12 2
„ plain muslins	„ (k)	—	9 -	—	—	9 -	8 9	8 3	8 6
„ „	„ (l)	—	14 6	—	—	14 5	13 11	12 5	12 10
„ pulicates	Prices (m)	- 6	- 7½	- 8	- 5	- 6	- 6	- 6	- 6
„ „	Wages (m)	12 3	15 9	16 9	10 -	12 3	12 3	12 3	12 3
„ shawls.....	„ (n)	—	17 6	—	—	13 10	13 6	13 -	12 -
„	„ (o)	—	—	—	—	—	—	—	—
Perth, pulicates	Prices (p)	—	—	—	- 1½	- 2	- 1½	- 2	- 1½
Lanark	Wages (q)	—	—	—	—	—	—	—	—

* See text, p. 427.

TABLE 32 *Contd.*—Wages of hand-loom weavers. 1792-1838.

Place.	Notes.*	1825.	1826.	1827.	1828.	1829.	1830.	1831.
		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Bolton	Wages (a)	8 6	7 -	6 6	6 -	5 6	5 6	5 6
„ jaconet	Prices (b)	- 7½	-	-	-	-	- 4	- 3½
„ quilts	„ (c)	6 -	6 -	6 -	6 -	6 -	6 -	-
„	„ (d)	-	-	-	-	-	-	-
„	„ (e)	-	-	-	-	-	-	-
Manchester, nankeens.....	Wages (f)	6 6	-	-	-	-	-	-
„ cambrics, 60-reed ..	„ (f)	6 3	-	-	-	-	-	-
„ 80 „ ..	„ (f)	6 6	-	-	-	-	-	-
„ quiltings, 36 „ ..	„ (f)	6 6	-	-	-	-	-	-
„ „ fine „ ..	„ (f)	8 6	-	-	-	-	-	-
Wigton, Cumberland	„ (g)	-	-	-	-	-	7/-, 8/1	6¼, 7/6
Glasgow	„ (h)	-	-	-	-	-	-	6 -
„ gingham	„ (i)	7 6	6 6	7 6	6 6	6 6	6 -	6 -
„ pulicates	„ (j)	10 -	8 2	10 -	8 5	8 -	7 6	7 6
„ plain muslins ..	„ (k)	9 -	7 2	6 9	7 3	6 3	5 3	5 6
„	„ (l)	15 -	9 5	8 11	9 2	7 11	6 5	6 5
„ pulicates	Prices (m)	- 5 -	- 4½	- 5½	- 3½	- 3½	- 3	- 3
„	Wages (n)	10 -	8 3	10 -	6 7	6 -	5 6	5 6
„ shawls	„ (n)	13 -	10 9	10 9	10 6	10 6	10 -	10 -
„	„ (o)	13 6	-	9 -	-	7 6	-	6 6
Perth, pulicates	Prices (p)	- 2	- 2½	- 1½	- 2½	- 2½	- 1½	- 1½
Lanark	Wages (q)	-	-	-	-	-	-	-

Place.	Notes.*	1832.	1833.	1834.	1835.	1836.	1837.	1838.
		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Bolton	Wages (a)	5 6	5 6	5 6	-	-	-	-
„ jaconet	Prices (b)	-	-	-	-	-	-	- 3½
„ quilts	„ (c)	-	-	-	-	-	-	-
„	„ (d)	-	-	-	-	-	-	-
„	„ (e)	-	-	-	-	-	-	-
Manchester, nankeens.....	Wages (f)	9 -	-	-	-	-	-	-
„ cambrics, 60-reed ..	„ (f)	} 6/-, 6/6	-	-	-	-	-	-
„ 80 „ ..	„ (f)		-	-	-	-	-	-
„ quiltings, 36 „ ..	„ (f)		-	-	-	-	-	-
„ „ fine „ ..	„ (f)	} 9/- to 12/-		-	-	-	-	-
Wigton, Cumberland	„ (g)	6¼, 7/6	6¼, 7/4	7/9, 9/6	6/3, 8/9	5/6, 7/5	4/3, 6/2	4/6, 7/6
Glasgow	„ (h)	-	-	-	-	-	-	-
„ gingham	„ (i)	5 9	5 3	6 6	6 8	5 9	4 3	4 6
„ pulicates	„ (j)	7 -	6 6	7 3	7 9	7 6	6 6	7 -
„ plain muslins ..	„ (k)	4 2	4 8	5 1	5 9	6 6	4 6	4 9
„	„ (l)	6 9	6 6	8 1	8 2	8 10	7 9	7 6
„ pulicates	Prices (m)	- 3	- 3	- 3½	- 3½	- 3½	- 3½	- 3½
„	Wages (n)	5 6	5 6	6 7	6 7	7 5	6 3	6 7
„ shawls.....	„ (n)	9 9	9 11	9 8	9 9	9 9	9 6	9 3
„	„ (o)	-	-	8 -	-	-	7 -	-
Perth, pulicates	Prices (p)	- 1½	- 1½	- 1½	- 1½	- 1½	- 2	- 1½
Lanark	Wages (q)	-	-	-	-	-	-	5 7½

* See text, p. 427.

TABLE 33.—GLASGOW. *Prices for weaving muslin, 1797 to 1834, with the weekly earnings.*

	March.						October.						
	1,200 quality.			1,400 quality.			1,200 quality.			1,400 quality.			
	Width.		Weekly aver- age.	Width.		Weekly aver- age.	Width.		Weekly aver- age.	Width.		Weekly aver- age.	
	4-4.	6-4.		4-4.	6-4.		4-4.	6-4.		4-4.	6-4.		
<i>d.</i>	<i>d.</i>	<i>s. d.</i>	<i>d.</i>	<i>d.</i>	<i>s. d.</i>	<i>d.</i>	<i>d.</i>	<i>s. d.</i>	<i>d.</i>	<i>d.</i>	<i>s. d.</i>		
1797...	7 ¹ / ₂	11 ¹ / ₂	12 2	12	18	—	7 ¹ / ₂	11 ¹ / ₂	12 2	12	18	—	
'98...	7	10 ¹ / ₂	13 3	10 ¹ / ₂	16 ¹ / ₂	—	7	10 ¹ / ₂	11 3	10 ¹ / ₂	16 ¹ / ₂	—	
'99...	7 ¹ / ₂	11 ¹ / ₂	13 5	12 ¹ / ₂	18 ¹ / ₂	—	8 ¹ / ₂	11 ¹ / ₂	13 10	12 ¹ / ₂	18 ¹ / ₂	—	
1800...	7	10 ¹ / ₂	13 1	11	16	15 2	7	9 ³ / ₄	13 7	11	14 ³ / ₄	13 5	
'01...	6 ¹ / ₂	9 ¹ / ₂	12 9	9 ¹ / ₂	14 ¹ / ₂	13 9	6 ¹ / ₂	9 ³ / ₄	12 9	9 ¹ / ₂	14 ³ / ₄	13 9	
'02...	7	10 ¹ / ₂	13 6	11	16 ¹ / ₂	15 2	7	10 ¹ / ₂	14 8	11 ¹ / ₂	17	14 1	
'03...	7	10 ¹ / ₂	14 1	11 ¹ / ₂	17	15 2	6 ¹ / ₂	9	13 2	10	15	13 5	
'04...	6 ¹ / ₂	9	13 2	10	15	13 5	6 ¹ / ₂	9 ³ / ₄	14 6	11 ¹ / ₂	17	14 11	
'05...	7 ¹ / ₂	11	15 4	13	19	21 9	8 ¹ / ₂	12	18 1	14	20	21 8	
'06...	8	11	17 8	14	19	21 6	10 ¹ / ₂	17	—	12 ¹ / ₂	17 ¹ / ₂	21 1	
'07...	7	9 ¹ / ₂	15 6	11 ¹ / ₂	16 ¹ / ₂	19 8	7	9 ¹ / ₂	15 6	11 ¹ / ₂	16 ¹ / ₂	19 8	
'08...	5 ¹ / ₂	7 ¹ / ₂	13 2	9 ¹ / ₂	13	15 9	5	7 ¹ / ₂	11 9	8 ¹ / ₂	11 ¹ / ₂	14 11	
'09...	5	7	11 9	8 ¹ / ₂	11 ¹ / ₂	14 11	5 ¹ / ₂	8	13 3	9 ¹ / ₂	13 ¹ / ₂	16 —	
1810...	6 ¹ / ₂	8 ¹ / ₂	14 9	10 ¹ / ₂	13 ¹ / ₂	16 3	6	8 ¹ / ₂	14 1	9 ¹ / ₂	13	15 5	
'11...	4 ¹ / ₂	6 ¹ / ₂	12 5	7	10 ¹ / ₂	13 6	4 ¹ / ₂	6 ¹ / ₂	11 1	7	9 ¹ / ₂	13 —	
'12...	5 ¹ / ₂	7 ¹ / ₂	13 2	8 ¹ / ₂	11 ¹ / ₂	15 7	5 ¹ / ₂	7 ¹ / ₂	13 2	8 ¹ / ₂	11 ¹ / ₂	15 7	
'13...	6	8	15 2	9	13	17 1	6	8 ¹ / ₂	15 2	9	13	17 8	
'14...	7 ¹ / ₂	10	17 4	11 ¹ / ₂	15	20 1	6	8 ¹ / ₂	14 4	9 ¹ / ₂	13	19 8	
'15...	6	8 ¹ / ₂	14 1	9	13	18 9	5 ¹ / ₂	7 ¹ / ₂	—	8 ¹ / ₂	11 ¹ / ₂	13 7	
'16...	4 ¹ / ₂	6 ¹ / ₂	—	10 ¹ / ₂	11 9	21 9	3 ¹ / ₂	4 ¹ / ₂	—	5 ¹ / ₂	7	9 1 ¹ / ₂	
'17...	3 ¹ / ₂	5	—	5 ¹ / ₂	7 ¹ / ₂	9	—	—	—	—	—	—	
1820...	3 ³ / ₄	4 ¹ / ₂	—	5 ¹ / ₂	7	—	3 ³ / ₄	4 ¹ / ₂	—	5 ¹ / ₂	7	—	
'21...	3 ³ / ₄	4 ¹ / ₂	—	5 ¹ / ₂	7	—	3 ³ / ₄	4 ¹ / ₂	—	5 ¹ / ₂	7	—	
'22...	3 ³ / ₄	4 ¹ / ₂	—	5 ¹ / ₂	7	—	2 ³ / ₄	4	—	4 ³ / ₄	6	—	
'23...	2 ³ / ₄	3 ³ / ₄	—	4 ¹ / ₂	5 ¹ / ₂	—	3	3 ³ / ₄	—	4 ³ / ₄	5 ¹ / ₂	—	
'24...	2 ³ / ₄	3 ³ / ₄	—	4 ¹ / ₂	5 ¹ / ₂	—	3	4 ¹ / ₂	—	4 ³ / ₄	6 ¹ / ₂	—	
'25...	2 ³ / ₄	3 ³ / ₄	—	5 ¹ / ₂	7 ¹ / ₂	—	3 ³ / ₄	5 ¹ / ₂	—	5 ¹ / ₂	7 ¹ / ₂	—	
'26...	2 ³ / ₄	3 ³ / ₄	—	4	5 ¹ / ₂	—	2 ³ / ₄	5 ¹ / ₂	—	2 ³ / ₄	4 ¹ / ₂	—	
'27...	2 ³ / ₄	2 ³ / ₄	—	2 ³ / ₄	4 ¹ / ₂	—	2 ³ / ₄	3	—	3 ³ / ₄	4 ¹ / ₂	—	
'28...	2 ³ / ₄	2 ³ / ₄	—	3 ³ / ₄	4 ¹ / ₂	—	2 ³ / ₄	3 ³ / ₄	—	3 ³ / ₄	4 ¹ / ₂	—	
'29...	2 ³ / ₄	2 ³ / ₄	—	2 ³ / ₄	3 ³ / ₄	—	2 ³ / ₄	2 ³ / ₄	—	2 ³ / ₄	3 ³ / ₄	—	
1830...	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	
'31...	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	
'32...	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	
'33...	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	2	2 ¹ / ₂	—	2 ¹ / ₂	3 ¹ / ₂	—	
'34...	2 ¹ / ₂	2 ¹ / ₂	—	3	4	—	—	—	—	—	—	—	

It was stated that the average wage of all muslin weavers in 1797 was 12s., and in 1834 6s. The earnings of a family consisting of a man, his wife, and two children would be, 1797, 14s., 1834, 7s. 6d. The earnings given in the table are the average of four weeks, by a good ordinary tradesman, of each breadth at each price.

TABLE 34.—*Prices paid to and earnings of hand-loom weavers in Lancashire, 1814-33.*

Year.	Near Colne.										Near Oldham.										
	Highest and lowest prices.		Average prices.		A good weaver could average		6 persons, including 3 children, would average		Repair of looms, rent, &c.		Leaving for food and clothing		Yearly income.		Price.		Farmer's 63 hours.		Rent, fuel, &c.		
s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	£	s.	d.	s.	d.	s.	d.	s.	d.	
1814.....	7	6	4	—	6	6	26	—	52	—	5	3	135	4	—	2	3½	13	9	3	7½
'15.....	5	—	3	6	4	3	17	1	34	2	5	3	88	16	8	1	11½	11	9	3	3¼
'16.....	4	6	2	9	3	4	13	5	26	10	5	3	69	15	4	1	6	9	—	2	9½
'17.....	3	3	2	9	3	—	12	1	24	2	5	3	62	16	8	1	1	6	6	2	4¾
'18.....	4	3	3	3	3	7	14	5	28	10	5	3	74	19	4	1	5½	8	9	2	8½
'19.....	4	—	2	9	3	1	12	6	25	—	5	3	65	—	—	1	8	10	—	2	11
1820.....	3	6	2	9	2	11	11	8	23	4	5	3	60	13	4	1	6	9	—	2	8¾
'21.....	3	6	2	10	3	2	12	7	28	3¼	5	3	73	12	3	1	5	8	6	2	7½
'22.....	2	9	2	3	2	6	10	2	22	10½	5	3	59	9	6	1	6	9	—	2	8¾
'23.....	2	6	2	—	2	4	9	4	21	—	5	3	54	12	—	1	7	9	6	2	9
'24.....	2	3	2	—	2	1	8	6	19	1½	5	3	49	14	6	1	7	9	6	2	8¾
'25.....	2	3	2	—	2	1	8	6	19	1½	5	3	49	14	6	1	5½	8	9	2	7
'26.....	2	—	1	—	1	4	5	3	11	10	4	3	30	14	3	1	1	6	6	2	1½
'27.....	2	—	1	3	1	7½	6	6	14	7½	4	3	38	—	6	1	1	6	6	2	2¾
'28.....	2	—	1	3	1	11	6	6	14	7½	4	3	38	—	6	1	2	7	—	2	3
'29.....	1	3	1	1½	1	2	4	8	10	6	4	3	27	—	6	1	—	6	—	2	—¼
1830.....	1	9	1	1½	1	6	6	—	13	6	4	3	35	2	2	—	10	5	—	1	10½
'31.....	1	9	1	6	1	7½	6	7	14	10	4	3	38	10	3	—	10	5	—	1	10½
'32.....	1	6	1	3	1	4	5	4	12	—	4	3	30	14	3	—	9½	4	6	1	9¼
'33.....	1	4	1	4	1	4	5	4	12	—	4	3	31	4	—	—	9½	4	6	1	9

Table 33 is from Maxwell's Manual Labour Machinery, and Table 34 is from the Report of the Select Committee on Manufactures, Commerce, and Shipping, 1833 [VI of 1833].

Much will be found to turn, in the sequel, on the wages of 1806 and 1830-38. Summarising the tabulated material, the following seems the course of wages indicated by it (calculated to the nearest 3*d.* per week):—

	s.	d.		s.	d.		s.	d.
1797	18	9	1811	12	3	1825	8	3
'98	19	9	'12	14	—	'26	7	9
'99	18	6	'13	15	—	'27	7	6
1800	18	9	'14	18	6	'28	7	3
'01	18	6	'15	13	6	'29	7	3
'02	21	—	'16	10	3	1830	6	3
'03	20	—	'17	8	9	'31	6	—
'04	20	—	'18	8	3	'32	6	—
'05	23	—	'19	8	3	'33	6	—
'06	20	—	1820	8	3	'34	7	—
'07	17	3	'21	8	3	'35	6	3
'08	13	3	'22	8	3	'36	6	3
'09	14	—	'23	8	3	'37	6	3
1810	14	3	'24	8	3	'38	6	3

This shows a very great fall, and it is necessary that we should err by under-stating rather than by over-stating so extraordinary a movement. A Glasgow weaver stated to Symonds that the average wages were 5*s.* 7*d.* net in 1838, and that the same labour would have obtained four times as much wages in 1814, twice as much in 1824-25, equal wage in 1826-29, more in 1829, and equal wage again in 1832-35. This is a fall of 75 per cent. in twenty years. Our estimate is roughly a fall of two-thirds in the same period. The highest point is shown for 1805, but this depends to some extent on the rise at Wigton, is contradicted by the Bolton series, and is substantiated by the Glasgow series and the Lanark figures. In 1806 our average is 20*s.* In that year we have 22*s.* at Bolton, substantiated as to the wage being near to 20*s.* by the proportionate prices shown for near that time in the other Bolton figures compared with 1824, when the earnings were between 6*s.* and 8*s.* 6*d.* At Manchester, in 1810, after a considerable fall had taken place in all districts for which we have earlier figures, the averages are from 14*s.* to 17*s.* 2*d.* This supports an estimate of 20*s.* in 1806. At Glasgow we have 13*s.* 6*d.* to 24*s.* 6*d.* as averages for 1810-16 (1815-16 were the years of the first permanent *great* fall), and these again lead to the conclusion that the average was over 20*s.* in 1806. The Lanark figures show 21*s.* in 1805 and 26*s.* 6*d.* in 1802. Maxwell's figures, taken from a master's book, show 17*s.* 8*d.* to 21*s.* 6*d.* in 1806, and show 1805 or 1806 to have been the year of the maximum. It would seem, therefore, that we are quite within the mark when we take 20*s.* as the wage in 1806. In 1830 to 1838 our average comes out at 6*s.* 3*d.* for the majority of the years. The evidence points to a lower rather than a higher average. At Glasgow, Symonds concluded that the majority of the weavers earned 5*s.* net, on fancy muslins 5*s.* to 8*s.* net, on fine Paisley and Edinburgh shawls 9*s.* to 14*s.*, and, very occasionally only, on fancy goods 20*s.* to 25*s.*,

and even 30s. In a few cases, where the looms were in a factory (and the majority were in the homes of the weavers to the end), the wages were 40 per cent. higher. Generally throughout Scotland the average is rarely given as above 6s. net; sometimes it even falls to 4s. 6d. In England we have 5s. 6d. at Bolton from 1830 to 1834, 4s. 6d. to 7s. 6d. at Carlisle in 1838 (4s. 6d. was the average of 813 weavers), 5s. 4d. near Colne and 4s. 6d. near Oldham in 1833, and from various portions of the 1838-40 Commission 7s. 4d. per family and 6s. per head of those working at Preston, 5s. to 6s. at Blackburn, 5s. 5d. at Wigan, 5s. 7d. at Bolton, 4s. 6d. to 12s., less 3d. in the 1s., at Ashton, 8s. 1d. outdoors and 9s. 8d. in factories at Patricroft, and many similar figures. Baines, on the other hand, estimated them at 7s. in 1833, and Ellison at 7s. in 1829-31 and 8s. in 1844-46. I cannot trace the evidence for so high a figure, and doubt if ever after 1829 the average rose to quite as high as 7s. In the period 1830-38, it seems quite evident from the above statements that 6s. to 6s. 3d. net is quite as high as the average rose to. Perhaps, however, Baines' figure is gross. If so, it is very close to 6s. 6d. net.

Our estimates agree in the main with the following summary by the members of the Committee in 1835. "It appears," says their report, "that the wages of the hand-loom weavers have been reduced generally since 1815 to one-half or one-third of the wages paid at that period, and that the sums reduced were largest in 1816, 1817, 1826, and 1829." "The fall during the previous years," says Professor Chapman,⁴ from whom the previous quotation is taken, "had been, roughly, from 30 to 50 per cent.; the total fall therefore ranged in all from 60 to 80 per cent." This would make 1835, 100; 1815, 200 to 300; 1800, 386 to 600. Our conclusions show 1835, 100; 1815, 220; and 1800, 300, or little more than the minimum fall estimated by Chapman and the House of Commons Committee. Mr. Bowley in his *Wages in the United Kingdom in the XIXth Century* gives as a result, "which does not pretend to exactness":—

1795.	1800.	1803.	1814.	1816.	1820.	1826.	1833.	1840.
400	300	260	220	110	100	50	60	60

indicating a much heavier fall than our estimate. We may feel secure, therefore, that in our result we have not over-estimated the amount of the fall, and that, if anything, we have under-estimated the wage in 1800-10 and over-estimated in 1830-38.

From 1838 to the end of hand-loom weaving there appears to have been very little change in the condition of the weavers.

Note.—It now remains to work the results arrived at for various centres given in this and the preceding pages into one complete index-number for the whole industry. This, it is proposed, will take the form of a paper to be submitted to the Society.

⁴ *Lancashire Cotton Industry*, p. 44.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*An elementary manual of statistics*. By Arthur L. Bowley. vi + 215 pp., 8vo. London: Macdonald and Evans, 1910. Price 5s. net.

Mr. Bowley's new manual is intended for a class of readers having less special training in statistics than those to whom his former text-book on the subject was addressed. It is divided into two parts, the first of which is devoted to general principles to be followed in the use and in the interpretation of statistics, while the second forms in some sense a guide to the official statistics of the United Kingdom, showing the nature of the contents of some of the principal publications of this character.

It is not necessary to say that Mr. Bowley sets before his readers high ideals in matters statistical. He gives them, too, much sound advice as to things to avoid, and as to where careful analysis is essential before accepting the apparent conclusions based on statistical data. He employs in general the newest material for his illustrations, and takes advantage of the newest methods, though avoiding in this volume the technical detail which would not be intelligible to those whom he more particularly addresses. He does, however, suggest in one place the adoption of certain new notations, though he leaves them to sink into the minds of his readers, and does not venture, by their general use, to give an unfamiliar appearance to his pages, except those devoted to the examples given as exercises for students. We cannot confess to finding the new notations sufficiently attractive to regret the course taken in regard to their actual use.

In statistics, as in other matters, the idealist is apt to be betrayed into doing as others do, though he may recognise the impropriety involved. One or two illustrations of this are found in the volume under discussion, as when the rule against working percentages to a degree of apparent precision not justified by the data from which

they are derived is forgotten in working out (p. 106) a factor of correction for the death-rate of London to four places of decimals. The data cited could not yield a factor in which the fourth decimal place is significant.

Mr. Bowley discourages the indiscriminate use of diagrams, and rightly so, and his observations on the points of a good diagram should be studied carefully by those who have not learned by experience the principles to be followed. It may, however, be permitted us to suggest that, in illustrating these principles, the condemnation as "incorrect" of certain modes of diagrammatic presentation (p. 45) is somewhat more sweeping than the particular instance given warrants. May not two quantities be related nearly as are x and y in the equation $x - a = m(y - b)$? If so, the comparison of the values of the two sides of this equation for different pairs of x 's and y 's would be quite permissible. And such a comparison is really made in the method described as "incorrect."

Throughout the volume Mr. Bowley naturally makes more extensive use of statistics of wages than of other groups of statistics, and methods of tabulation and analysis can be very effectively illustrated from the material now available relating to wages. The selection of much illustrative material from the field which has been especially cultivated by the author, therefore, in no degree limits the effectiveness of his illustrations.

The second part of the volume passes in review the official statistics relating to population, trade, prices, production, employment, wages and income, and taxation. The idea is so useful that one is tempted to wish that something of the same kind could be carried out for those who do not belong to the public particularly addressed in this manual. To do this would demand the co-operation of those who have intimate special knowledge in the various sections into which a guide to official statistics would naturally be divided. Would not this be an appropriate task for a committee of the Royal Statistical Society? If carried out it might reveal to the different members of the committee who should be engaged upon it a not inconsiderable wealth of useful material hidden in publications with which they were not familiar. The suggestion that such an enterprise would be of great utility may perhaps prove to be not the least service rendered by the preparation of the brief outline contained in the second part of Mr. Bowley's volume.

In regard to the chapter dealing with trade and transport, a suggestion or two may not be out of place. On p. 115 an attempt to define *General* and *Special* trade is made. It should not be overlooked that no uniform definitions can apply even to all the more important countries. The practice of Germany is not in accord with either definition given, for some through-transit trade is not included in its *general* trade figures, while its *special* exports include some goods which have not undergone a process of manufacture in Germany. In each of the last two years, for example, nearly 3,000,000*l.* in value of raw cotton has been included in the *special exports* of Germany.

When mentioning that the basis of valuation of imports into the

United States is the prices of the goods in the country whence imported, freight and other transport charges not being included, Mr. Bowley has overlooked the fact that the same is true for Canada; and the volume of importation into Canada is now large enough to make such a consideration of importance.

The footnote on p. 120, regarding the destinations of exports from the United Kingdom, does not seem to be in full accordance with the statements made in the introductions to the Annual Statement of Trade; and, though attention is drawn to the date relating to the classification of trade by countries of consignment given in the supplementary volumes to the Annual Statement for five years past, the fact that the monthly accounts have given figures on this basis since the beginning of last year seems to have been overlooked. As in so large a number of cases Mr. Bowley is careful to use the most recently published statistics, this omission is the more noteworthy.

In the explanation of the relation of the *net* to the *gross* tonnage of a ship, mention is made of the allowances made for engine space, &c., and for the crew's quarters, but the allowance for the space devoted to the accommodation of passengers in the case of passenger vessels is not mentioned. This is an allowance of great importance in the latest types of passenger liners, so that the oversight is not negligible.

In mentioning the above points, we have ventured to respond to the author's invitation, we believe, in the spirit in which that invitation of criticism was inserted in the preface. A.W.F.

2.—*Statistik und Gesellschaftslehre*. Von Dr. Georg von Mayr. Dritter Band. *Sozialstatistik* (*Moralstatistik, Bildungsstatistik, Wirtschaftsstatistik, Politische Statistik*). Erste Lieferung. 260 pp. Tübingen: Mohr, 1909.

The first and second volumes of this important work were noticed in the *Journal* in 1895 and 1897 respectively. We welcome this third instalment after so long an interval, and hope that the author will be able to complete the work, which we understand is well advanced, in the near future.

The volume before us is not complete in itself, and its plan can only be understood by the general scheme, which is as follows:—

Erster Band. Theoretische Statistik (1895).

Zweiter Band. Praktische Statistik. I Teil. Bevölkerungsstatistik, Demologie (1897).

Dritter Band. II Teil. Sozialstatistik. Erste Lieferung (1909). Moralstatistik.

We gather that the work will be complete in two more volumes, which will form the second and third numbers (Lieferungen) of the Part dealing with social statistics.

The present volume contains part only of Book I, moral statistics, a subject which will be completed in the next volume, and be followed by books on educational, commercial, and political statistics.

Book I is divided into three or more sections (Abschnitt), the sections are divided into chapters (whose length varies from 1 page to 159 pages), and we finally get to such a complication as

Section 21 of Band III, "Abnormitäten der Kindersterblichkeit," which is under the sub-heading, "Bevölkerungswechsel" of the division B, "Sekundär-Moralstatistisches aus der Statistik der Bevölkerungsbewegung" of Chapter I, "Sekundär-Moralstatistisches aus der Bevölkerungs-Statistik" of Section II. "Sekundär-Moralstatistisches" of Book I, "Moralstatistik" of Part II ("Sozialstatistik") of "Praktische Statistik," which is the second great division of the general subject, "Statistik und Gesellschaftslehre."

It is greatly to be desired that the whole work when it is completed should be re-cast in a simpler and less pedantic form. The actual structure of the work is an example of what statistics should not be, for the first, if not also the last, law of practical statistics is perfect lucidity.

We should expect from the author a thorough scholarly work, combining profundity with a wealth of illustration and interesting practical results, and we are in no way disappointed. After showing that the special difficulty in Moral Statistics is to know the real connection of the data with the phenomena underlying them, he proceeds to discuss the relations that come to light on analysis of the statistics obtained in the Population Censuses; these he calls secondary statistics, and arranges the discussion under the same headings as in his second volume (Population). The principal subjects dealt with are birth-, death-, and marriage-rates, age and sex distribution, and the size and constitution of the family. His plan is to discuss the deviations from the norm in each of his subjects, and it is shown incidentally how very small and misleading is the information that a mere arithmetical average gives. Thus, to give examples of great demographic divergence, we notice that, whereas in the United States as a whole, in 1900, there were 954 females to 1,000 males, in Wyoming the number was 590, and in Massachusetts was 1,111. Whereas in the most recent censuses there were 260 persons under 15 years per 1,000 inhabitants in France, the corresponding number in New Zealand was 400.

Perhaps the most interesting section is that which deals with the size of the household, a subject for which much information exists, but has not yet been tabulated for the English census, unless in connection with overcrowding. The following extract shows the kind of information :—

Graduation of the size of households.

Number of persons in household.	Percentage number of households.		
	Germany.	Italy.	France.
1	7	9	16
2	15	16	22
3	17	16	20
4	17	15	16
5	15	14	11
6 and over	29	30	15
	100	100	100

We hope that the Registrar-General will spend his leisure moments, before next year's schedules come in, in studying these and other results and devising tabulations which will enable the author in his next edition to include returns from England. That the new question in our coming census as to the number of children to a marriage can lead to interesting tables is abundantly shown in this volume; and that the results obtained will have very important sociological bearings is evident from the pages relating to fertility in different classes.

After the "secondary" statistics, we have one chapter on the statistics of divorce, at the end of which the volume abruptly stops.

We wish that the author could arrange for an English translation of the whole series to be published at the same time as the final numbers; and we suggest, with all deference, that more attention may be paid to clearness of the headings of the tables inserted.

A.L.B.

3.—*Le coût de la vie.* Par E. Levasseur. 33 pp., 8vo. Brussels: *Revue Économique Internationale*, 1909.

The article bearing the above title, which appeared in the *Revue Économique Internationale* in May of last year, presents the results of an inquiry into the prices paid for the principal articles of food at 70 French Lycées selected and grouped so as to illustrate the differences due to geographical situation, and also the differences between the larger and the smaller establishments. It is not wholly clear that the comparisons given express the effects of the scales of purchase only, as the relation of the position of the institutions to the centres of supply is not the same for the larger and smaller; that is, they do not, apparently, in general represent markets quite identical.

The results obtained are compared by M. Levasseur with those expressed in various index numbers compiled in France and in other countries, such as, for example, that of Mr. Sauerbeck for England. Some comparisons are also made with other records relating to prices of the same or similar commodities in France, such as the prices paid by one of the great railway companies and by the *Assistance publique*.

The study of these various comparisons in detail will interest the students of price statistics, but it will be sufficient to refer here to the general results attained. These are expressed in index numbers calculated on the basis of 100 for the average prices of the years 1895 and 1900. The data secured relate to the years 1880, 1885, 1890, 1895, and to each of the years 1900 to 1908, and the prices of 20 articles of food were secured and used in compiling these numbers, together with the price of coal. The general price index resulting from the calculations fell from 111.9 in 1880 to 104.2 in 1885, and thence gradually to 99.3 in 1900. From 1900 to 1906 the fluctuations were slight, the greatest movement being a fall to 98.0 in 1905, from 99.9 in 1904. The upward movement after 1906 was rapid, and the index number for 1908 was 106.5.

The tables and diagrams given in the article show that the

fluctuations were generally similar in tendency, but less in range, than those of the well-known index numbers of wholesale prices. M. Levasseur's numbers represent prices of articles purchased in substantial quantities by contract, not ordinary retail prices. Most of the articles are represented in the records for the different geographical groups, but not all, so that the general averages for these groups are not quite comparable. The process adopted in averaging is not explained. An attempt to verify the assumption that a simple arithmetic average was used, working from details for 1908 which are printed, was not successful.

A.W.F.

4.—*L'organisation syndicale des chefs d'industrie. Étude sur les syndicats industriels en Belgique.* Par Georges de Leener, professeur à l'Université de Bruxelles, assistant à l'Institut de Sociologie Solvay. 2 vols., 8vo, xx + 395 and xxi + 580 pp. Vol. 1. *Les Faits.* Vol. 2. *La Théorie.* [No. 5 of the series of *Études sociales* of the Institut de Sociologie Solvay.] Brussels: Misch and Thron, 1909.

The author's previous work on industrial syndicates in Belgium rapidly passed through two editions, and it is in response to the call for a third that he has prepared the present treatise, which not only brings down to the year 1908 the information contained in the former volume, first published in 1903, and supplemented by information derived from a recent thorough inquiry into the facts, but is practically a new work, in the first volume of which the results of that inquiry are systematised and in the second the theory is developed. A scientific investigation of the phenomena of the movement is, indeed, essentially necessary. The author defines an industrial syndicate as any group, temporary or permanent, of chiefs of industry united with the object of realising a collective accord on the conditions of production. These conditions may relate either to employment, to sale, or to purchase. The author does not include in his research syndicates of speculation, such as "corners" and "rings."

M. de Leener is not of opinion that the modern industrial syndicates are a direct continuation either of the ancient Roman professional corporations or of the mediæval guilds, though in some respects they exercise the same functions. Their methods are clearly distinguishable. In his view the earliest appearance of groups of the kind was in England, where they existed as far back as 1590; their origin in Belgium goes back to 1828. For England, the author divides them into amalgamations and associations, the former equivalent to the American trust, the latter to the German cartel. The French "comptoir" is a modification of the cartel. A recent development is the establishment of international syndicates, such as the Borax Consolidated Company in 1899. His opinion is that, since 1875, the syndicate organisation has become a general fact in the great industries of many countries, and will be a permanent element of the industrial world.

So far as regards Belgium, M. de Leener considers the several industries separately under 14 heads, describing for each the origin, the legal constitution, the methods of action, and the results

obtained. The details contained in this chapter, which occupies more than 300 pages, are too voluminous for any abstract or summary to be given of them here; and it may be observed that they contain little statistical material. The author has published his researches rather as a narrative, including reproductions or digests of formal documents, than as a body of precise statistical information. For this he doubtless had sufficient reason. Exact statistical information as to undertakings of this kind is probably not easily obtainable.

The second volume is divided into four parts; the first contains a discussion, partly historical and partly statistical, of the economic conjunctions of the nineteenth century and the present conditions of trade and competition; the second, of the nature, effects, and conditions of economic co-ordination; the third, of the structure, creation, and activities of industrial syndicates; and the fourth, of the economic antagonism and harmonies arising out of them—the opposing interests of the producer and the consumer, of the employer and the workman, the situation of the middleman, and the conditions of competition in free enterprise. In conclusion, the author asserts the opinion that the syndicate system tends to cover the whole field of industry, but is unable to constitute a condition of absolute monopoly; that it is a product of natural evolution, and a necessity of the times; and that its consequences are, on the whole, beneficial. There is danger of abuse, which several States have endeavoured to meet by legislation; but he is of opinion that while such legislation should be sufficiently stringent to protect the interests of the public, it should be combined with a frank recognition of the legitimacy of the principle. The system appears to him to be evidence of an existing tendency towards new social conditions, and an advance towards industrial progress. As these are views upon which opinions greatly differ, and conclusions that might be hotly contested, it is not necessary in this Journal to state the arguments for or against them. *Aliis extendum.* All who are interested in the subject, whatever their views may be, must be grateful to M. de Leener for his indefatigable research, and for the thorough manner in which he has submitted its results to the consideration of the public.

E.B.

5.—*Théorie de l'impôt progressif.* Par Louis Suret, Docteur en droit. 774 pp., diagrams, 8vo. Paris: Felix Alcan, 1910. Price 15 frs.

This exhaustive study is more than an examination of progression in taxation; it covers the whole ground of the theories which underlie taxation, and includes a full *résumé* of the opinions of the best-known economists on the subject, generally in their own words. In this way, after a valuable chapter of definitions, the theory of exchange, or "benefit" theory (as it is often described in this country), the theory of ability or sacrifice, and a synthesis of the two theories are in turn discussed. Then follows a chapter on the "State socialist" theory associated with the name of A. Wagner; another on the defence of progressive taxes as compensation, either for the inequalities of fortune due to the direct action of the State

or for the necessary existence of taxes on consumption, which are held to be in general regressive, *i.e.*, to fall most heavily on the poorest classes. Finally, the author considers taxation theories divorced from the idea of justice, such as that the business of taxation is to furnish resources for government (McCulloch), that the employment of a progressive system is an insurance against social revolution, that taxation must, from the nature of things, always favour the most powerful classes in a State at the expense of the rest (Loria).

The book is thus largely a compendium of economic opinion on the subjects treated, and a discussion of the relation of the various theories to the question of "proportional" *versus* "progressive" taxation. It would give an impression of inextricable confusion if it were not for the judicious summaries in which the author from time to time comments upon the doctrines he quotes in such profusion. Some of his conclusions may be just touched upon. One is that except in France the "sacrifice" theory has quite superseded the "benefits" theory of taxation, and that this has facilitated the adoption on the part of the majority of modern economists of the argument in favour of progressive taxation. Another point which seems to emerge is that the identification of progression with socialism or communism arises from a misconception of socialist aims and doctrines. But M. Suret shows a wholesome distrust of the possibility of arriving at any scientific rule of taxation from any of the theories above-mentioned as at present developed. In an interesting section he discusses the question whether inequality of fortune is increasing or diminishing, whether progressive taxation can exercise an important influence on the distribution of wealth, and whether the fact of its exercising influence in the direction of diminishing inequality justifies the accusation of spoliation. M. Suret discusses these questions with acumen and moderation. In his discussion of the regressivity of certain parts of fiscal systems, he reviews many of the well-known studies of incidence—those of Levi, Jevons, Neumann, Le Roy Beaulieu—but points out that the problem of incidence, one of the most difficult in the whole range of political economy, has up to the present time not been attacked with any real success. He would probably hardly claim to have made much positive addition in this volume to the stock of knowledge or original thought on fiscal matters, but he has rendered an even more important service to students and to all who desire to trace some principle in existing tendencies of taxation by his comprehensive and logical analysis of the theories which, when all is said and done, have had so great a practical influence on the fiscal systems of the modern world. It is a work which none but a French writer could have performed so well.

B.M.

6.—*The People's Progress. A study of the facts of national wealth, with some answers to Socialists.* By Frank Ireson, B.A. viii + 159 pp., 8vo. London: John Murray, 1910. Price 2s. 6d.

Mr. Ireson has gone to the best available sources for his data, and has handled them boldly and clearly; it is not his fault that

the information on which he depends is so uncertain, but if he had realised how much guess-work is involved in the estimates of the various parts of the national income, he would have proceeded less dogmatically and with more caution. He refutes with success the wilder of the statements which he quotes from socialistic writings, but it is not possible either to prove or disprove the results he reaches by more refined analysis. Take for example his argument as to savings. He takes it as granted that 250,000,000*l.* is saved annually, giving reference to the late Sir R. Giffen's paper on *The Wealth of Empire* (Economic Inquiries, xxix); in that paper no data whatever are given to show how the estimate is obtained, and no use is made of it, for it is a residuum when estimated expenditure is subtracted from estimated income. This assumed total he then distributes arbitrarily between the savings of various classes (p. 24); then assuming that 51,000,000*l.* is saved out of 121,000,000*l.* received in incomes over 5,000*l.* a year, he finds that there are 10,000 rich families, and that their joint expenditure, after investments are made, is not more than 70,000,000*l.* But there is a great divergence of opinion as to the total, and no information as to the savings; consequently no use can be made of the last-named estimate. This illustration is typical of the rough way in which these very hazardous assumptions are handled. It may be pointed out that Sir R. Giffen in the paper referred to only roughly brought up to date (1902) a former estimate made in 1881, and that the distribution of wages quoted from the same authority (p. 6) is dated 1886; very much has happened in thirty years that may have profoundly affected the whole basis of the estimates.

The author lays stress on the much neglected problem of family income, pointing out, for example, the frequency with which house-rent is paid for by a group of two or more wage-earners, whether members of a family, or whether the head of a family and a lodger; but that the lower middle-class has, on the average, 8 earners to 7 families, while among manual workers there are 7 earners to 3 families, is a quite unsupported estimate.

The chapter on "Income not available for redistribution" is very useful in giving practical instances in which income as reckoned depends on the existing social system and competitive valuation. But surely the author is wrong in implying that a domestic servant's income is now counted twice over, while in a socialistic regime it would be counted once; for at present we have (1) the services rendered by the servant and consumed by the master, and (2) the utilities consumed by the servant, as the correlatives of the two incomes, and there will be no diminution in utilities produced if the servant works for the community. It is well known that from this point of view there is no essential difference between a servant, a private secretary and a business clerk. As regards the main point, viz., the enhancement of apparent income by the fictitiously high values of the services of rich professionals, it should be remarked that at the other end of the scale there are low values of the services of the poor to the poor, and that the great part of domestic work, being unpaid, is not included in estimates of total

national income at all. The aggregate income under a socialistic regime would be on a different valuation to that under a competitive regime. Arguments, to be relevant, should relate almost exclusively to the reduction of the production of utilities without the stimulus of competition and ownership on the one side, and the saving of waste that results from competition on the other.

Useful chapters are devoted to the relation between the net income-tax assessment and net income as understood by a commercial community, but again we cannot follow the author in his estimates. He argues that there is less evasion of the tax than is sometimes estimated, but the only evasion he deals with is understatement; the question is whether there is much income from foreign sources received in the United Kingdom whose existence is unknown (though not unsuspected) by the Income-Tax Commissioners; whatever there is of this kind is additive to all Mr. Ireson's tables, which are not intended to exclude interest from investments abroad. Again, annual depreciation in shares or total loss of capital should not be deducted from available annual income, unless equally appreciation is added; that 60,000 companies disappeared between 1862 and 1906 is not to the point. The illustration on a smaller scale (p. 54) of a man who invests 100*l.* in each of 10 companies, loses one of these capitals entirely, but has still to pay income-tax on the dividends from the other nine, makes the same assumption that capital tends to be lost rather than to increase; he would not pay any more tax if the shares in the other nine companies had all risen 20 per cent. On the other hand, it would be correct to adjust the annual *savings* by the increase or diminution in the value of existing capital, if this could be done, before casting the final balance-sheet. Our author is presumably correct in stating that the tax-surveyors disallow many items of depreciation that an auditor would pass, but he has no data for an estimate of the extent of this over-valuation, and he does not make sufficient allowance for the one-sixth and one-eighth allowed off the annual value of houses and lands respectively in their assessment. Nor does his illustration on p. 52 seem to hold water: "If A buys for 700*l.* the last ten years of the lease of a house let at 100*l.* per annum, he puts by 70*l.* each year to replace his capital, and reckons his annual profit at only 30*l.* But the Inland Revenue authorities allow of no such deduction." Now we have here 100*l.* worth annually of utilities which are strictly income; if the original holder had not sold he would have paid the tax, the sixth part deduction allowed on houses being the set-off against depreciation; when he receives the 700*l.* in a lump sum from A, it is not charged for income-tax, but the tax is obtained annually. This being known to A, he presumably diminishes his offer by the extent of the extra tax he will have to pay, and if he does not, it is no affair of the tax-surveyor. A's only grievance would be if the tax were perceptibly raised during his holding. But in any case the income is there, and properly reckoned as such, whatever the incidence of the tax.

From these illustrations it will be seen that the author raises many important and neglected questions. He discusses them with

lucidity, skill, and knowledge, and he has produced a book which cannot safely be overlooked by those who are in the habit of pointing to a great amount of unearned income which might be available for division among the working classes; and it should be seriously considered by those who hold the more moderate view that there is much surplus income which can safely be taxed for the promotion of social reforms. A.L.B.

7.—*English Poor Law policy.* By Sidney and Beatrice Webb. 379 pp. Longmans, Green and Co., 1910. Price 7s. 6d. net.

This book is in the main (273 pages) a reprint of a report upon 'the policy for the relief of destitution from time to time laid down by the central authority between 1834 and the present day,' which was prepared at the request of the Documents Committee of the Poor Law Commission, and presented to them in July, 1907. But, in addition, it criticises (45 pp.) the Report of the Royal Commission itself, "to see how far that body responded to the suggestion that it should formulate a definite body of principles upon which public assistance should proceed." The authors contend that Poor Law administration has departed widely from the principles of 1834, and that boards of guardians are in a state of hopeless bewilderment what the new principles are, to what classes of paupers they are to be applied, and what safeguards and qualifications they demand. "There is, in fact, to-day, a sort of 'no man's land' in Poor Law administration, in which the principles of 1834 have been *de facto* abandoned, without the principles of 1907 being consciously substituted. Owing to this lack of central direction we find diversity without deliberation, indulgence without cure, and relief without discipline." The principles of national uniformity, and of less eligibility, and the workhouse system have now, the authors assert, given place to the principles of curative treatment, of compulsion, and of universal provision. The change is alleged to have taken place unconsciously; "indeed, it is open to question whether successive presidents and particular officials, if suddenly cross-examined, might not reveal a complete unconsciousness of there being any new principles at all, and whether they might not profess to be still standing on the policy of 1834."

In order to support the allegation as to complete change of principles, the history of the Poor Law is carefully traced from 1834 onwards, in the first five chapters of the book, but we are not convinced by it that the main principles laid down by the Royal Commission of 1832 have ever been abandoned. What has taken place is not a change of principles, but a change in their application. The Poor Law indeed has gone through an evolutionary process during the last seventy-five years, as has happened in the case of other social and political questions, but the struggle has never been abandoned to maintain the old principles intact. Indeed, although the Minority Report would do away with them by breaking-up the Poor Law altogether, the Majority Report not only recognises their force, but to a large extent wishes to bring public opinion back to recognise the eternal truths which underlie them. Mr. and Mrs. Webb

know this perfectly well. For example, one of the main principles of 1834, which must be added to the other three which they mention, is that, while the Poor Law should relieve destitution only, charity should be able to deal with poverty and cure. So late as 1869 this principle was reiterated as follows: "The fundamental doctrine of the English Poor Laws, in which they differ from those of most other countries, is that relief is given, not as a matter of charity, but of legal obligation; and to extend this legal obligation beyond the class to which it now applies—namely, the actually destitute—to a further and much larger class—namely, those in receipt of insufficient wages—would not only be to increase to an unlimited extent the present enormous expenditure, but to allow the belief in a legal claim to public money in every emergency to supplant, in a further portion of the population, the full recognition of the necessity for self-reliance and thrift. "It is clear, therefore, that the Poor Law authorities could not be allowed without further danger to extend their operations beyond those persons who are actually destitute, and for whom they are at present legally bound to provide. It would seem to follow that charitable organisations, whose claim could in no case be claimed as a right, would find their most appropriate sphere in assisting those who have some but insufficient means, and who, though on the verge of pauperism, are not actually paupers, leaving to the operation of the general law the provision for the totally destitute." (Minute of Poor Law Board, 1869.) One has only to read the reports of the Poor Law inspectors, which since 1886 have been published in the annual reports of the Local Government Board, to realise how much alive the old principles are. The so-called "principles of 1907" are in fact the principles of Mr. and Mrs. Sidney Webb, however much they may try to disguise the fact. They have not been recognised officially, nor are they generally received as "going concerns." Indeed, the majority of the Commissioners argue for placing the care of underfed children and of the unemployed under the public assistance authorities. They want to preserve the Poor Law as a distinct entity, and see no necessity for breaking it up.

It is perfectly true, as we have already remarked, that the old principles are applied differently now than they were possibly intended to be applied by the Royal Commissioners of 1832. For example, the proposal to deal with that class of mental defectives to which the term "feeble-minded" is applied is merely an extension of our present lunacy laws. This class is quite a recent discovery, and the application of the deterrent principle to them is from the very nature of their misfortune impossible, the real ground of their claim for help being their mental condition and not their poverty. So, too, the casual pauper or vagrant can, without violating any of the old principles, be removed from the care of the Poor Law authorities to that of the police, as proposed by the Departmental Committee of 1904. The treatment of cases of infection by the sanitary authorities can be defended on the same grounds. The improved treatment of the sick, and of dependent children, does

not contravene any canon of Poor Law administration. But the endeavour to make Poor Law administration as uniform as possible for different classes of paupers, to make Poor Law relief as deterrent as possible, and to apply the workhouse test to the able-bodied at least, has since 1834 always been and still is the aim of all those who are not Fabians or Socialists. If the aged poor over 70 and the unemployed in large towns have been drawn from the control of the Poor Law, it has been owing to political expediency with the object of gaining popularity for one political party. The grant of free education was nothing but a gigantic political bribe, just as in the case of free old age pensions. Universal free feeding is the next move in the game which Mr. and Mrs. Sidney Webb are carrying on so merrily. We cannot but admire their energy and perseverance in the pursuit of curative treatment, compulsion, and universal provision. They might well adopt the motto of the French Revolutionist, "Sois mon frère ou je te tue." I would suggest as a headline for every Fabian tract, "Cure and Compulsion!" It does not seem to me that their latest book will obtain them many converts, except among a certain number of young dons and undergraduates, or among the impulsive class of philanthropists. It almost goes without saying that it is well and ably written, and undoubtedly an important contribution to the literature on the subject.

W.C.

8.—*Principles of Political Economy*. By John Stuart Mill. Edited with an introduction by W. J. Ashley, M.A., M.Com. 1013 + liii pp., cr. 8vo. London: Longmans, Green and Co., 1909. Price 5s. net.

In the sixty years which have elapsed since 1848, when Mill's "Principles of Political Economy" was first published, economic inquiry and research have not stood still; but this special offspring of his fertile mind has not yet lost its place in the very foremost rank of systematic treatises in its own particular division of scientific study. As Professor Ashley says in his admirable Introduction to this new edition, "Mill's *Principles* will long continue to be read and will deserve to be read." The book represents indeed an "interesting phase in the intellectual history of the nineteenth century"; and Professor Ashley has skilfully contrived to say exactly what was necessary to convey to future readers an adequate account and estimate of Mill's "transitional" position. But its "merit," he adds with truth, is "more than historical."

We might have felt sure beforehand that Professor Ashley would bring to this fresh issue of an old and famous treatise the qualities associated with the new work he has himself accomplished in economic study. We have not been in any measure disappointed. The careful collation made between the varying statements in the different issues that appeared during Mill's own lifetime is both interesting and instructive. Similarly, the "bibliographical appendix," dealing with certain passages where Mill's final exposition should be read to-day in the light of subsequent addition or correction, was happily conceived; and, in the somewhat narrow

limits set by considerations of the space allowed, the idea has been carried out with success. We would however deprecate the small type employed. The catholicity of spirit of the commentator is no less conspicuous here than the breadth of his erudition, while his equipoise of judgment has been tested in deciding what he should include, and what he should omit, in order to supply the reader with the information necessary for his guidance. These notes, we imagine, are intended in most instances to whet the appetite for further individual study rather than to yield entire satisfaction; and for this modest purpose they are well designed. All this additional help offered opportunely to intelligent perusal may, we believe, be traced to the instinct and the training belonging, as we should anticipate, to an economist who, like Professor Ashley, has given such a powerful impulse to those historico-economical studies which originated, or were born again, in an age following that of Mill himself. The mere summary indeed on the back of the title-page, stating the number and the dates of each edition, is now a familiar feature of books of every class; but in a sense it too may be considered an outcome and an illustration of historical methods of inquiry. In this particular instance it is a very forcible reminder of past influence and of continuing popularity.

Yet we might perhaps have fancied at the outset that the present editor of Mill's "Principles" would be more severe than he has been in condemnation of errors and defects. We could possibly have presumed that he might have shown himself less appreciative of merits than an economist who had busied himself more closely with, and was more frankly interested in, deductive theoretical analysis. For Mill himself could hardly be described with any propriety as an economic historian; and with all his sane enthusiasm for practical reform his treatise was in the main planned and executed, as Professor Ashley shows, on Ricardian lines. Such forebodings, had we entertained them, would nevertheless have been agreeably disappointed. Professor Ashley is too honest to avoid conveying here and there a hint which would be amplified by more explicit statement; and the expert controversialist, on the watch for signs of the particular direction in which the "wind is blowing," might without much difficulty, we suppose, interpret some *obiter dicta* which are uttered in a sense hostile to Mill. The editor's own opinion about certain fundamental issues to which he alludes is no secret. In this special case, too, a considerable divergence can, as he shows, be noticed between those Ricardian tenets under whose study Mill had been brought irretrievably by the dominating personality of his magisterial father and such humanising influences as those represented respectively by Coleridge, by Comte, and by his wife. To these in turn Mill confessedly was sensible in later life. He sought painfully indeed for some half-way house in which he could rest, and he thought that he had discovered such an intellectual shelter, unsatisfactory as this halting spot may subsequently have seemed to those who followed him when they were asked to take it as a permanent abode. But, in spite of any personal leanings he may feel, Professor Ashley has been laudably punctilious in this

Introduction to avoid inappropriate polemical discussion. He says only what is necessary to make Mill's position clear; and his eulogy has the unmistakable ring of genuine conviction. When indeed we remember that the wage-fund theory, which Mill finally abandoned, remains without commentary in his book, that monetary discussion has since his day followed a direction in which he did not turn his eyes, and points of view have been opened out which never entered into his own survey, and that many prominent economists have abandoned the general arrangement of material which he adopted, those who pride themselves on being "up to date" might be disposed to thrust his "Principles" impatiently aside, or to pass their expositor by as inadequate and obsolete. Professor Ashley, however, whose prepossessions would not have seemed likely to favour Mill, bestows a handsome but not exaggerated panegyric, finely conceived and aptly phrased.

As a further recommendation we may add that the readable type in which the text, at any rate, of this compact edition, unlike some previous issues that were set up in double columns, has been printed, and the excellent index, supplied for the first time, through the indefatigable co-operation of Miss M. A. Ellis, to whom the editor also expresses his indebtedness in the new comparison he has made of the varying expression of his reasoning by the author, will enhance the pleasure of future students in following the example of their predecessors in handling this economic "classic." L.L.P.

9.—*Liberty and Progress*. By C. Y. C. Dawbarn, M.A. 339 + xvi pp., 8vo. London: Longmans, Green and Co., 1909. Price 9s. net.

In these times, when we are assured, in the oft-quoted language of a prominent politician, that "we are all socialists," it is refreshing to find the courage and robustness of conviction, combined with the shrewd insight and the power of simple and direct statement, which belong to the author of this "apology" for individualism. We say "apology," but we are not sure that the term is not inappropriate; for Mr. Dawbarn's method of defence could, we think, be described more correctly as that of offensive warfare. He carries the battle into the enemy's camp, and pushes home his attack. It is true that now and then he may appear to yield some amount of ground; and sympathetic critics might perhaps think that he was guilty of unseasonable weakness in granting concessions inconsistent with the watchword inscribed upon his banner. But he contrives with unexpected opportune dexterity to bring these slanting movements into ultimate accord with the main lines of his straightforward onset, and he certainly betrays no such timidity as might be likely to attend any tactical withdrawal from the final issues of the strategy he has planned and announced.

The book is, in fact, an outspoken advocacy of individual "liberty" as the solid and permanent foundation of all "progress." Our author does not, however, shrink from disclosing the unamiable features of the creed he adopts and recommends. Nor does he shut his eyes to the hard results of its full acceptance. He would,

indeed, as we have noticed, tolerate, or even approve, such expedients as graduated taxation, or the enforcement of a *minimum* wage, at least in certain occupations, which have met with favour from writers more socialistically inclined. He seems, if we understand him aright, to join a recognition of the need or benefit of trade unionism, as at present constituted and employed in the existing state of industrial relations, to an appreciation of the much greater good which it could do in the future, if actuated by a different spirit, and directed to other ends, than those it now often pursues; and he does not refrain from some condemnatory strictures passed upon the injury, direct or indirect, which in the past this particular instrument has wrought to unorganised workmen, or to society in general. Nevertheless, his disposition and attitude are fundamentally individualist. The reforms of the Poor Law, to which he lends his own support, are such as will build up, and not undermine, the independence of the pauper. He is in favour, for example, of remedial treatment in farm colonies. But he would not lessen parental responsibility in any sensible degree, and he would give scant consideration to legislative schemes which would threaten or disturb the security of property, whether in capital, or in land, or in labour. In lack of thrift, in self-indulgence, in drunkenness or other such demoralising vice, in the reckless assumption of the grave responsibilities attaching to improvident marriages, he discerns the most prolific causes of the misery and poverty around us, and he can find no healing virtue in any proposed reforms that do not address themselves to the permanent improvement of deteriorated human character, by the most drastic methods, if necessary, of repression and correction.

In his strong and reiterated insistence on the impending menace, or the actual pressure, of over-population, as in his emphatic assertion of the great progress in material comfort and industrial efficiency achieved in the last half century or so, which may be traced to the accumulation and co-operation of capital, he is in evident sympathy with the reasonings and conclusions of the so-called "orthodox" economists. Those who do not agree with him might not unjustly urge that the ancient discredited idea of an economic "harmony" can be seen continually beneath his argument, when he maintains that on the whole it would be in the interests of all or most that competition should prevail, for it would bring about the best results. Their suspicions would perhaps have been aroused at the outset by his open admiration of Jeremy Bentham, to whom he constantly refers throughout, and they would be confirmed by the frequency of his ample quotations from an economist of the political leaning and intellectual colour of Henry Fawcett. It is true that Mr. Dawbarn also cites some passages from F. A. Walker, who would probably be considered less out of date by recent critics, and there is more than one sign that his own reading has not been limited to these two authorities alone. But on the other hand he makes no secret in his Preface of his avowed intention. He tells us there that "no new gospel is preached" in this book; but that "probably at most will only be

found old truths re-stated and forgotten teachings re-enforced." "What has been attempted," he declares, "is the application of old principles to new conditions and the fair and impartial ascertainment of what these new conditions are which we could modify or amend." It is in this spirit, then, and with this object, that he dwells on the importance of "an all-round view," that he deprecates the imitation by the Anglo-Saxon, traditionally proud of his "overmastering love of personal liberty," of institutions suitable to Germany, where the "people are mothered by their government from the cradle to the grave," that he urges that "an inch in the way is worth a mile in the clouds," and that he contends that "nothing is more impossible than to try to remedy a past abuse by a present reform." These quotations aptly indicate the goal and scope of his book; and most of his readers, whether they agree, or whether they do not agree, with his premises and deductions will, we think, at least regard as unexceptional his aim to "see things as they are as far as possible and so present them." He gives forcible expression to one side of an arguable case which has needed some re-statement.

L.L.P.

10.—*Monopole, Kartelle, und Trusts in ihren Beziehungen zur Organisation der kapitalistischen Industrie.* Von Dr. Hermann Levy. xiv + 323 pp., 8vo. Jena: Gustav Fischer, 1909. Price 7 marks 50 pf.

This excellent book is a valuable contribution to the study of trusts and monopolies in their relation to the development of British industry. Such criticisms as may be offered arise in the main not from serious faults in the book, but from the fact that, according to the different point of view which one may take up, one may feel inclined to lay more or less stress on certain points than the author does. The only really serious defect is that Dr. Levy has somewhat wilfully chosen to limit the scope of his studies, and to exclude certain economic phenomena which are of the highest importance in relation to his main topic.

Dr. Levy shows that early in the history of the capitalistic organisation of British industry, long before the advent of the factory system, the characteristic form was monopoly. Those industries which dealt with the extraction of raw materials required most capital, and at the same time, either through natural scarcity or favourable transport conditions, enabled the capitalists to obtain control over certain important markets. In other cases tariff privileges and sole rights of manufacture were granted to Court favourites on the plea of establishing new industries, introducing new processes, or developing old trades, and in many cases national monopolies grew out of those grants. Those far and ill-famed Elizabethan and Stuart monopolies were worked with a ruthlessness and a disregard of consumers which would do credit to the most autocratic of modern trusts, and these characteristics, together with their dependence on the arbitrary power of the Crown, stamped upon monopoly a hateful meaning which it has never since lost. After a long Parliamentary struggle they all disappeared before the

end of the seventeenth century, and the rapid outburst of production which followed the re-establishment of free competition showed that they had been a serious hindrance to industry. So complete was the substitution of the new principle of freedom for the old rule of privilege that when the classic economists wrote they assumed as a matter of course that free competition was the natural condition of industry. Yet even in the latter part of the eighteenth century there were two important combinations. The first of these was the "limitation of the vend" in the North of England coal industry, which, in combination with the London "coal ring," dominated the London coal market from 1771 to 1844, and only fell to pieces when the extension of railways brought new coal mining districts into competition. The second existed in copper mining from about 1785 onwards, and apparently was only dissolved when England lost her position as the leading producer of copper.

This early history occupies almost the whole of the first half of Dr. Levy's book, and we owe him hearty thanks for his clear, succinct, and interesting account of many remarkable combinations whose former activity is too little known, or indeed has been in some cases altogether forgotten. The nineteenth century was given up to free competition, and as long as there was enough of the melon to cut up everyone was willing to struggle for a slice. One of the most important chapters in the book is devoted to an analysis of the reasons why the development of combinations occurred much later in Britain than in Germany and the United States. Dr. Levy truly denies the pretended innate individualism of the British manufacturer, and shows that he has always been ready to combine with his fellows to raise prices, but he omits to notice that the British pride in the family name of an old-established business has often made men unwilling to sink their firm in a new amalgamation while they have freely joined in temporary combinations. This characteristic has played some part in determining the form development should take. The first important condition which was wanting in Britain was the possibility of creating monopolies in raw materials. The only mineral for which England is not dependent on foreign supplies is coal, and the impossibility of harmonising the interests of the wide-spread mining districts has always prevented monopolistic combinations. This is true, but if the economic history of the last few years could be written in full it would probably show that coal-owners have exercised no little influence in the maintenance of market-prices. The second missing condition is a protective tariff; the reality or possibility of the importation of foreign goods has prevented the creation of some trusts, and has limited the activity of those which do exist. This is a truth of the highest importance, and Dr. Levy has done well in recurring to it again and again with ever-increasing emphasis. The third condition necessary for the emergence of monopolies is that the competitors are few enough to come to an agreement, whereas in most British industries there is still an abundance of participants. Nevertheless concentration has gone on rapidly, and in many industries the desire to abolish profit-destroying competition or to

secure economy of production as a safeguard against foreign rivalry has led to the creation of a number of amalgamations or combinations. Such organisations arise in trades which enjoy a freight-protection against foreign competition, or which are protected by the quality of their goods or low cost of production, or which have made international agreements with their foreign competitors. Fifteen illustrative examples are analysed briefly and shrewdly.

In conclusion Dr. Levy rapidly compares the economic position in Britain, Germany, and America. The monopolising of raw materials, protective tariffs, and a freight-protection ruling over a large extent of their inland territory have enabled these last two countries to enter upon the trust movement much earlier than Britain and before the concentration of industry had proceeded to the same point as in the latter country. Their possession of the sources of raw materials secures German and American monopolies against fresh domestic competition, and the tariff barrier permits a considerable increase of prices. In Great Britain, on the contrary, trusts and kartells can only succeed when the competitors are limited to a couple of dozen firms, and their chief object is to avert future domestic competition by their efficiency and economy. In Great Britain monopoly shows itself as the final consequence of the modern industrial organisation of the large capital type, free from any adventitious aids such as tariffs, but the introduction of a tariff system would immediately alter the situation in favour of the more rapid development of combinations.

Considering the strong emphasis which Dr. Levy lays upon the relation between monopolies and tariffs, it is remarkable that he somewhat peremptorily sweeps aside all those imperfect and temporary organisations which seek to control prices, and somewhat contemptuously dismisses those writers who painfully consider them. From the standpoint of an expert in American and German conditions they are no doubt insignificant enough, but they are highly characteristic of British industry. In the unfavourable conditions for the emergence of perfect monopolies British manufactures combine temporarily to utilise some favourable conjuncture, and when the moment passes their union dissolves. The obvious conclusion that to introduce a tariff would be to render this machinery permanent would have illuminated all Dr. Levy's reasoning; but he perversely throws it aside because he is dealing with temporary organisations which did not correspond to the Platonic idea of the perfect trust. This appears to us regrettable, and it is much to be hoped that Dr. Levy will take a less exacting standpoint and examine these associations. He would find them worth studying, and we would benefit by the keen analysis to which he would submit them.

H.W.M.

11.—*Other New Publications.**

[These notes do not preclude a fuller review in a later issue of the Journal.]

Borghst (Dr. R. van der). Vorträge der Gehe-Stiftung zu Dresden. Band II, 1910. Beruf, gesellschaftliche Gliederung und Betrieb im Deutschen Reiche. 137 pp., 8vo. Leipzig: B. G. Teubner, 1910. Price 2 marks 80 pf.

[This is an interesting study of the great German industrial census of 1907, taken for the purpose of ascertaining the distribution of the population according to the trade or occupation followed by each person. In addition, the book deals with the number of agricultural and industrial undertakings, classed, as in the census, according to size and industry. There is an appendix of tables comparing the statistics of the census of 1907 with those for the two preceding enumerations in 1882 and 1895.]

Cutforth (A. E.). Treatment of fluctuating currency in accounts. 8vo. London: Gee and Co., 1910. Price 2s. 6d.

[An attempt to explain in detail the treatment of a fluctuating currency by accountants in this country, a subject which is not usually dealt with in books on foreign exchanges.]

Dienstag (Dr. Paul). Die deutsche Uhrenindustrie. Eine Darstellung der technischen Entwicklung und ihrer volkswirtschaftlichen Bedeutung. 240 pp., 8vo. Leipzig: Dr. Werner Klinkhardt, 1910. Price 5 marks 25 pf.

[An economic study of the German clock and watch industry. The author gives statistics of the production of watches, &c., in certain districts for a series of years together with details of the numbers employed, earnings and social conditions.]

Gow, Wilson, and Stanton (Messrs.). Rubber producing companies (capitalised in sterling), with list of directors. Reprint of 3rd edition, 1909, revised up to March, 1910. xl+468 pp., 8vo. London, 1910. Price 2s. 6d.

[A revised edition opportunely published.]

March (Lucien). Influence des variations des prix sur le mouvement des dépenses ménagères à Paris. 32 pp., 8vo. Nancy: Berger-Levrault et Cie., 1910.

[A statistical study of the influences of changes in prices on household expenses and cost of living in Paris, the upward trend of which is undisputed. The writer points out that it is necessary to examine the question under two heads, and to find out to what extent the increased cost of living is due to higher prices and to what extent to the higher standard of comfort now prevalent among the general population. The paper is illustrated by several diagrams.]

Marriott (J. A. R.). Second Chambers: an inductive study in political science. viii+312 pp., 8vo. Oxford: The Clarendon Press, 1910. Price 5s. net.

[This book is a fragment of a larger work upon which the author is engaged, and which he hopes to complete "within a reasonable time." The present instalment, it is hoped, may contribute towards the solution of a problem of immediate importance. It is a survey of bi-cameral legislatures in this and other countries.]

* See also "Additions to the Library," pages 468, *sqq.*

Marraud (Angel). La question sociale en Espagne. 475 pp., 8vo. Paris: Felix Alcan, 1910. Price 7 francs.

[The material for this volume has been compiled from information obtained by the author during two investigations made by him in Spain under the auspices of the Musée Social, Paris. As the author points out, until a few years ago social statistics practically did not exist in Spain, and this volume is therefore a valuable contribution to social science. The book is divided into two parts, the first dealing with the origin and the actual state of the social question in Spain, and the second with reforms and the efforts made by the State and by other agencies to minimise some of the more pressing evils from which the country is suffering.]

Muirhead (J. M. P.). The Black Danger. 4 pp., 8vo. Cape Town, 1910.

[The writer of this pamphlet examines the census figures of the different States of South Africa, which are admittedly not complete as regards the non-white population, and also the registration returns. In view of the likelihood of a large immigration of whites in the future, he does not think there is anything to fear from the so-called "Black Danger," i.e., the possibility of the preponderance of a coloured over a white population.]

Phelps (Edward B.). An analysis of some phases of American mortality statistics for the nine years 1900-08. 14 pp., 8vo. New York, 1909.

[A pamphlet compiled from the mortality statistics issued by the United States Census Office. This, the writer believes, is the first detailed comparison of the kind for the period in question. It is pointed out that the limitations of the vital statistics of the United States should not be overlooked, owing, among other reasons, to the constantly changing character of the population. With these reservations, however, the data presented may be accepted as the most trustworthy information on the subject now obtainable.]

Smith (H. B. Lees). India and the tariff problem. vii + 120 pp., 8vo. London: Constable and Co., 1909. Price 3s. 6d. net.

[A recapitulation of official information regarding production and trade in India, intended to promote a "strong free trade school amongst Indian thinkers," in order that that country may be saved from the vices of protection, and England from a "staggering blow in the only great free market she now enjoys."]

Troitzsch (Fritz). Das Seilergewerbe in Deutschland, eine Darstellung seiner wirtschaftlichen und technischen Entwicklung von der Zunftzeit an bis zur Gegenwart. 144 pp., 8vo. Leipzig: Dr. Werner Klinkhardt, 1910. Price 3 marks 15 pf.

[A short description of the rope industry in Germany, its development and present conditions. Particulars are given of the numbers employed, of their earnings, and of their social condition. Statistics as to the numbers, &c., employed, taken from the German industrial censuses of 1882 and 1895, are given as an appendix.

Zolla (Daniel). Les fibres textiles d'origine animale (soie et laine), avec graphiques dans le texte (Encyclopédie Scientifique, publiée sous la direction du Dr. Toulouse). ix + 362 pp., 8vo. Paris: O. Doin et Fils, 1910. Price 5 francs.

[An economic, statistical and technical study of silk and wool. The production, commerce and consumption of these two fibres in the principal countries are carefully studied and explained. The book contains numerous statistical tables and charts, and a short though adequate bibliography.]

California. Report on labour laws and labour conditions of foreign countries in relation to strikes and lockouts. 157 pp., Svo. Sacramento, 1910.

[A useful compilation of the labour laws and conditions of workers in the principal European countries, in Australia, and in New Zealand. The writer, M. Weinstock, was sent as Special Labour Commissioner to investigate the subject of this report in the countries described, with a view to obtaining such information as would enable him to advise his Government as to the best means of lessening strikes and lockouts in California.]

Massachusetts. Bureau of Statistics, Municipal Bulletin No. 1. A uniform classification of municipal receipts and payments. 64 pp., Svo. Boston, 1910.

[Owing to the want of uniformity in the accounts of the different municipalities of Massachusetts, statistical comparison of their finances has been exceedingly difficult. To remedy this evil, the Legislature has enacted that each town shall be supplied by the Bureau of Statistics with forms so arranged as to provide for uniform returns of their receipts and payments and other financial transactions. The methods of classification are explained in detail.]

CURRENT NOTES.

On March 17 the Bank of England rate was raised to 4 per cent., and the market immediately justified the action of the Bank. The reserve on that day was $4\frac{3}{4}$ millions below the amount held last year, and the coin and bullion $5\frac{1}{2}$ millions less. Some foreign and colonial loans have taken gold from our store, and America has made further and not inconsiderable demands on it. The market is still disturbed by the non-collection of the income tax and the consequent issue of Treasury Bills. The high rate of discount has begun to attract gold from the United States, and it is hoped, though without much confidence, that the movement will continue. A large amount, however, has been taken from the Bank for Brazil, and more will probably be sent to that country. A Servian Loan is to be brought out shortly, and if it is introduced partially on this market it may bring to London a share of the financial business of South-Eastern Europe, of which but little is at present known on our Stock Exchange, and which hitherto has been almost entirely transacted in Paris, Berlin, and Amsterdam. Consols have recovered since the redemption of War Stock, but the issue of Exchequer bonds has passed off quietly; 21,000,000*l.* was subscribed twice over, and the price maintained at $99\frac{1}{2}$.

During the month of March the silver market has been decidedly strong, the price rising from $23\frac{3}{16}d.$ per oz. for spot silver and $23\frac{1}{4}d.$ for delivery in two months to $24\frac{3}{16}d.$ for both spot and forward delivery.

Home Railway Stocks have continued pretty firm on traffics and trade reports. The Stock Exchange has been dominated by rubber, speculation in other departments having been diminished by the mania for rubber shares. These have, in nearly all cases, been paid for so far, and buyers wishing to realise on any considerable scale will probably find difficulty in doing so. New companies have been formed and their prospectus issued. In most cases the shares have been greedily subscribed, and prices sent to ridiculous figures, shares of 2*s.* each having been quoted 10*s.* to 12*s.* before a bale of rubber could have been gathered, probably in some cases before a tree has been tapped. The enormous price of rubber (it has recently touched 12*s.* 4*d.* a lb.) has upset all calculations. The difficulty now is approximately to guess a price which will promote production and not hamper consumption. It is difficult to limit the uses to which rubber can or may be applied.

An unlimited field is contemplated quite apart from the constantly increasing demands for motor tyres and for the coupling hose of railway brakes. The market has therefore run wild. Prices are quoted recklessly, and brokers hardly know how they stand, with the result that the disorganisation has reacted on all other markets. The boom in rubber has during the last month been accompanied by a boom in oil. Discoveries reported from new and old oil fields have tempted promoters, and new companies have been organised to operate in them to a considerable extent; but it will probably be some weeks before an accurate estimate of the requirements of these two industries can be made. It must be remembered that both rubber and oil are non-British products, and to exploit either will take gold from this country in considerable quantities before the products can be brought into commercial use.

Mr. Sauerbeck's index-number of prices for March is 79·1, the average of the eleven years 1867-77 being taken as 100. The advance shown during the last year continues, and the number this month is higher than that of last month, which stood at 78·1, by 1·1 per cent. Corn showed no marked change, but mutton reached a high level, while pork and sugar also rose. Copper and London house coal were slightly cheaper. Textiles were firm, linseed oil was very dear, and tallow and palm oil were somewhat higher. The index-number for food has risen from 75·5 in January to 76·8, or by 1·3 per cent., while materials have risen from 79·8 to 80·8, or by 1·1 per cent. The price of silver was low early in the month, but showed a gradual improvement later.

The trade returns for the month of March, as will be seen from the subjoined tables, indicate a continuation of the progress recorded during the last few months, both in imports and exports. The imports of cotton, however, are again unsatisfactory, showing a decline in quantity of 774,263 ewt. (44·5 per cent.) and in value of 322,883*l.* (6·8 per cent.). The exports of cotton were also reduced. Cotton yarn declined in quantity by 3,223,700 lbs. (16·4 per cent.), while the value advanced by 34,371*l.* (3·3 per cent.); cotton piece goods declined in quantity by 17,048,300 yards (3·4 per cent.) and increased in value by 379,710*l.* (6·5 per cent.). Woollen and worsted manufactures have increased in value by 760,548*l.*; silk manufactures have advanced by 26,340*l.*, and other textile manufactures by 49,501*l.* The export of new ships is reduced in number by 38, the tonnage is lower by 34,773 tons, and the value is less by 624,738*l.*

Imports.	March, 1910.	Increase (+) or decrease (—) in March, 1910, compared with March, 1909.
Imports, value c.i.f.—	£	£
I. Food, drink and tobacco	22,289,893	+ 1,071,212
II. Raw materials and articles mainly unmanufactured	21,774,257	+ 4,084,330
III. Articles wholly or mainly manufactured	13,890,366	+ 943,914
IV. Miscellaneous and unclassi- fied (including parcel post)	165,877	+ 7,472
Total merchandise	58,120,393	+ 6,106,928
Imports of bullion and specie	6,365,838	— 2,933,223

Exports.	March, 1910.	Increase (+) or decrease (—) in March, 1910, compared with March, 1909.
Exports, of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£
I. Food, drink and tobacco	1,738,483	+ 7,368
II. Raw materials and articles mainly unmanufactured	4,379,118	+ 171,289
III. Articles wholly or mainly manufactured	27,728,746	+ 2,320,083
IV. Miscellaneous and unclassi- fied (including parcel post)	515,211	— 11,855
Exports of foreign and colonial merchandise, value f.o.b.—		
I. Food, drink and tobacco	977,405	— 142,570
II. Raw materials and articles mainly unmanufactured	5,349,234	+ 984,839
III. Articles wholly or mainly manufactured	2,104,076	+ 66,162
IV. Miscellaneous and unclassi- fied (including parcel post)	13,273	— 4,762
Total, British, foreign and colonial	42,835,546	+ 3,390,554
Exports of bullion and specie	5,958,688	+ 3,207,929

Shipping (foreign trade).	March, 1910.	Increase (+) or decrease (—) in March, 1910, as compared with March, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	3,152,698	+ 23,638
Total, British and foreign, <i>cleared</i> } with cargoes	4,626,513	— 28,967

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending March 26, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth-rates.	Mean Death-rates from all causes.
		Births.	Deaths.		
England and Wales (76 great towns).....	16,713,617	33,113	17,782	25·8	13·9
Scotland (8 principal towns).....	1,891,921	3,580	2,380	24·7	16·4
Ireland (Dublin registration area and 21 urban districts)	1,151,790	2,451	1,865	27·8	21·1

The birth-rates show no marked changes, but both the English and Scotch death-rates are distinctly lower than last year, when they ranged respectively from 19·8 to 22·1, and from 20·5 to 21·6. The Irish death-rate also is somewhat lower than during February, 1910, as well as during the corresponding weeks last year. In February it averaged 24·1, while in March, 1909, it stood at 24·4.

Commencing with the week ending April 9, the Registrar-General's Weekly Return of Births and Deaths has reference to 77 great towns instead of 76 as formerly, the birth and death rates being now calculated on the basis of a weekly population of 324,894, as against 320,535, the figure employed until April 9 for 1910.

The following returns relating to pauperism, from data supplied by the Local Government Board in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for March, 1910:—

Selected urban districts.	Paupers on one day in the second week of February, 1910.				Increase (+) or decrease (—) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	82,606	45,991	128,597	267	+ 8	— 10
West Ham	5,233	12,506	17,739	229	+ 8	— 15
Other districts	77,308	128,691	205,999	219	+ 5	....
Scotland	11,879	35,657	47,536	223	+ 1	....
Ireland	16,327	13,170	29,497	263	+ 8	— 2
Total, February, 1910	193,353	236,015	429,368	235	+ 6	— 3

According to the Board of Trade *Labour Gazette*, the state of the labour market in February was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
February, 1910	416	701,252	40,121	5·7
January, 1910	416	694,456	47,259	6·8
February, 1909	416	696,688	58,670	8·4

As compared with January, employment in February showed a general improvement, quite apart from the usual seasonal increase of employment in the building and clothing industries. Comparison with the corresponding month last year is equally satisfactory, and in some cases very striking. The cotton trade, however, is still much affected by the high price of raw material.

Commencing with the issue for March, 1910, the German monthly returns of trade with foreign countries [*“Monatliche ‘Nachweise über den auswärtigen Handel Deutschlands’*”] will contain information respecting (1) the trade in unfinished articles imported for “improvement” (*Veredelung*) and re-exported; (2) various exemptions from the customs tariff; and (3) payments of duty under separate heads of the tariff.

A letter signed by Mr. Geoffrey Drage and Sir Edward Brabrook, with reference to the forthcoming International Congress of Social Insurances, appeared in *The Times* of April 4. The writers of the letter have been requested by the permanent committee of the International Congress of Social Insurances (which held its last meeting at Rome in 1908) to form a national committee for Great Britain, so as to ensure the adequate representation of this country at the meeting of the congress to be held at The Hague from September 6 to 8, 1910. They are also instructed to obtain reports from competent persons on the questions to be discussed at that meeting. Those proposed for oral discussion are (1) the contribution of the State to old-age and invalidity pensions, and the relation between social insurance and public assistance; and (2) the organisation of medical service in social insurances and the relation between insurance and social hygiene. Papers will also be received on (1) the extension of social insurance to new classes of beneficiaries; (2) assurance for widows and orphans; and (3) assurances against unemployment. An appeal is made to members of both Houses of Parliament, to actuaries, medical men, economists,

employers of industry, trade unionists, representatives of friendly societies, and other qualified persons for offers of service on the proposed National Committee; to competent experts for reports or papers on the subjects indicated above; and to all who are interested in those subjects for their support to and attendance at the Congress. The subscription to the Congress is 15 frs., and an addition of 5 frs. will obtain the privileges of the Congress for any member of the subscriber's family who may wish to attend. Communications may be addressed to Sir Edward Brabrook, at 1, Garden Court, Temple.

The Bureau of Statistics of the United States Department of Agriculture have issued two reports dealing, respectively, with the exports from, and imports into, the United States from 1851 to 1908. The work, which was carried out under the direction of Mr. George K. Holmes, the "Statistical Scientist" in charge of the Division of Production and Distribution, is based upon the reports on "The Foreign Commerce and Navigation of the United States," published by the Department of Commerce and Labour, and is the only exhaustive presentation of these returns in a single report. The report dealing with exports is partly a revision of Bulletin No. 34 of the former independent Division of Foreign Markets, which has now been superseded by the Division of Production and Distribution of the Department of Agriculture. New aggregates of articles have, however, been made, and a radical change of form has been adopted for the purpose of making the statistics agree in form and substance with the annual statement issued by the Bureau of Statistics of the Department of Agriculture.

The value of exports of domestic farm products from the United States increased from an average of \$150,000,000 in 1851-55 to \$875,000,000 in 1901-05. The value of exports of domestic merchandise other than farm products has increased even more rapidly, as is shown by the relative importance of farm products in the total exports. During 1851-55 farm products constituted four-fifths of the total exports, and in 1901-05 only three-fifths. The excess of exports of farm products in each of twenty-three years during the fifty-eight years was sufficient to overcome an excess of imports in the trade in other merchandise. The largest excess in exports over imports of all merchandise was \$666,000,000 in 1908, and the next largest was \$665,000,000 in 1901. The imports of farm products into the United States during the same period of fifty-eight years

increased nearly nine-fold, the value in 1851 being \$61,000,000, and in 1908, \$540,000,000. Farm products constituted 28 per cent. of the total imports in 1851-55, and had increased to 47 per cent. by 1901-05. In three of the five-year periods considered in the report, and in eleven of the individual years, more than one-half of the imports consisted of farm products.

The appointment is announced of Dr. Robert Meyer as President of the Imperial and Royal Austrian Central Statistical Commission, in succession to the late Dr. Franz Ritter von Juraschek.

With profound regret we have to record the death on the 12th inst. of Sir Robert Giffen, whose influence during the past thirty years on the development of statistical knowledge in this country is universally recognised. He became a Fellow of this Society in 1867, was one of its Honorary Secretaries from 1876 to 1891, and was also for a time editor of the Journal. During the two years 1882-84 he filled the office of President. A notice of his career must be reserved for the next Journal.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

The Accountant, 1910—

March 19—The Sale of Goods Act: *Mason (A. V.)*.

April 2—Some points in foreign commercial and company law of interest to accountants: *Guedulla (H.)*.

April 9—The audit and investigation of the accounts of executors and trustees: *Paula (F. R. M. de)*.

Accountants' Magazine. April, 1910—Building societies: *Wallace (D. E.)*. The ranking of secured creditors: *Aitken (H.)*.

Banker's Magazine. April, 1910—The city, the government, and the national finances: *K. (A. W.)*. Progress of banking in Great Britain and Ireland during 1909. No. 3. Balance-sheets of banks in the United Kingdom. Canadian banking, 1909.

Economic Journal. March, 1910—Tax reform movement in the United States: *Plehn (Prof. Carl)*. Assessment of weekly and monthly tenancies for local taxation: *Lyons (F. O.)*. Organisation of consumption: *Furnivall (J. S.)*. True cost of secondary education for girls: *Young (Ruth)*. Low meadow customs at Yarnton, Oxon: *Gretton (R. H.)*. Wasting assets and income-tax: *Stamp (J.)*. Auctioneers and auctions: *Plumridge (H. W.)*. Municipal enterprise in Germany: *Epstein (M.)*. Japanese finance: *Soyeda (J.)*. Report of the Municipal Taxation Committee of the United provinces of Agra and Oudh, 1908-09: *Barker (D. B.)*.

Financial Review of Reviews. April, 1910—The natural resources of the United States: *Wallace (Prof. Robert)*. The finance of "New Liberalism": *Bull (Sir William)*. Banks and insurance companies: a reply to Dr. Beattie Crozier: *Palgrave (Sir R. H. Inglis)*. Irish land purchase finance: *Lough (The Right Hon. Thomas)*.

Journal of the Board of Agriculture. March, 1910—Forestry education in Great Britain. The Danish system of cattle breeding: *Mörkeberg (Peter Aug.)*.

Journal of Institute of Bankers. April, 1910—Gilbart Lectures, 1910: *Paget (Sir John)*. Clearing House returns of the United States.

Journal of the Statistical and Social Inquiry Society of Ireland. December, 1909—The external commerce of Ireland: *Samuels (A. W.)*. Methods of registering and estimating the population of Ireland before 1864: *Wood (Herbert)*. Remedies for overcrowding in the city of Dublin: *Lawson (William)*. The duty of the State towards the pauper children of Ireland: *Millin (S. S.)*. A review of the general topographical index of Ireland published in connection with the census of 1901: *Matheson (Sir Robert E.)*. Forestry: its present position and future prospects in Ireland: *Muriel (C. E.)*. Some consideration relating to the statistics of Irish production and trade: *Adams (W. G. S.)*.

UNITED KINGDOM—*Contd.*

- United Empire: The Royal Colonial Institute Journal.* April, 1910—The influence of Imperial responsibilities on educational reform: *Gray (Rev. H. B.)*. The administration of Africa: *Grant (Prof. W. L.)*.
- Surveyors' Institution. Transactions. Session 1909-10. Part 8*—The Surveyors' Institution (a forty years' retrospect): *Rogers (J. C.)*.
- Surveyors' Institution. Professional Notes. Vol. 16. Part 1.* March, 1910—Tithe commutation rent-charge. Value for 1910: *Grellier (H. M.)*. The weather and the wheat crop, 1908 and 1909: *Dickson (T. A.)*.

UNITED STATES—

- American Journal of Sociology.* January, 1910—Race and marriage: *Weatherley (U. G.)*. The American reformatory prison system: *Brockway (Z. R.)*. Improvements in industrial life insurance: *Henderson (C. R.)*. Municipal review, 1908-09: *Woodruff (C. R.)*. The definition of the city: *Munnier (René)*. The teaching of sociology.
- Annals of American Academy of Political and Social Science*—
- March, 1910—Contains a series of papers by different authors dealing with public recreation facilities in the United States.
- Supplement—Contains a series of papers by different authors dealing with child-employing industries in the United States.
- Bankers' Magazine (New York).* March 1910—Poverty—the crime of society: *Holmes (J. H.)*. Canadian banking and commerce: *Eckardt (H. M. P.)*. The United States Treasury. III: *Smith (William H.)*. The unequal incidence of the New York savings bank tax: *Ferris (Richard)*.
- Political Science Quarterly.* March, 1910—Congress and the Supreme Court: *Bowman (H. M.)*. The Payne-Aldrich tariff: *Fisk (G. M.)*. Municipal government in Porto Rico. II: *Willoughby (W. F.)*. Monetary experiences of the Argentine: *Grinfeld (Isaac)*. The British Budget and social reform: *Paish (George)*.

FRANCE—

- Annales des Sciences Politiques.* March, 1910—Le système commercial de Colbert. II: *Arnauné (A.)*. L'Éthiopie et l'expansion européenne en Afrique orientale: *Ferry (R.)*. La propriété artistique et littéraire et la conférence de Berlin (1908): *Poinsard (Léon)*. L'organisation municipale dans les villes de la Pologne russe: *Vimard (Henri)*. Chronique des questions ouvrières 1909: *Festy (O.)*.
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FRANCE—Contd.

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MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended April 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

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Austria-Hungary—

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Hungary—

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Cuba—

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France—

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JOURNAL OF THE ROYAL STATISTICAL SOCIETY.

MAY, 1910.

*The GENERAL ELECTION of JANUARY, 1910, and the BEARING
of the RESULTS on SOME PROBLEMS of REPRESENTATION.*

By S. ROSENBAUM.

[Read before the Royal Statistical Society, April 19, 1910.
The President, Sir J. A. BAINES, C.S.I., in the Chair.]

At the general election which took place in the months of January and February last there were contests in 571 constituencies. In all these contested seats there were 1,240 candidates, and the number of members returned was 595. The number of valid votes cast for all the candidates was 6,667,834, of which 3,814,501 were given for the successful and 2,853,333 for the unsuccessful candidates. The number of names on the parliamentary register for the whole of the United Kingdom on January 1, 1910, was 7,695,717, of which 7,202,005 were found in the constituencies where contested elections took place, and 493,712 in the 75 constituencies whose members were returned unopposed. These are the main aggregates of the figures which are subjected to analysis in the present Paper.

I propose to leave to the last a discussion of the important question, the most important, I believe, to which these figures can be put of how far the Parliament which assembled as a result of the elections can be regarded as in any respects a mirror of the political thoughts and aspirations of the people. If the House of Commons is to be regarded as the nation in microcosm, how far do our present electoral methods supply a result in harmony with this ideal?

In the first place, what was the extent of the franchise? That is to say, what is the proportion which the legally-qualified electors bear to the population? As is well known, the present electoral laws operate so as to produce a sort of electoral college, upon whom devolves the duty of choosing members for Parliament. The members of this college are constituted not by election but by selection; and not merely by selection but by the elimination of those who may not be members. Thus, women are first of all disqualified,

then persons under 21, then peers and paupers, then those who have not qualified by residence in a given constituency for a specified period, and so on. It is no part of my present purpose to discuss any of these disqualifications. I wish only to point out the relation between the number of qualified electors and the total and adult male population in the three Kingdoms. This is shown in the following table, of which columns 2 and 3 are taken from a reply to a question addressed to the Home Secretary, Mr. Winston Churchill, on March 2:—

TABLE 1.—*Population and electors in England and Wales, Scotland and Ireland.*

	1	2	3	4	5
	Estimated population.	Estimated adult male population on January 1, 1910.	Number of persons on Parliamentary registers for 1910.	Ratios of electors to population (per cent.).	Ratios of electors to adult male population (per cent.).
England and Wales	35,961,000	9,440,000	6,222,054	17·3	65·9
Scotland	4,903,000	1,261,572	785,208	16·0	62·2
Ireland	4,376,000	1,210,046	688,787	15·7	56·9
United Kingdom....	45,240,000	11,911,618	7,696,049*	17·0	64·7

* The figure given by Mr. Churchill differs slightly from that in the Parliamentary Return. An error of 10,000 in the total Irish electorate given in the Return is also corrected above.

In proportion to the entire population it appears that in England and Wales the number of electors is rather more than one-sixth, and in Scotland rather less. The differences between these ratios for Ireland and Great Britain are striking, especially as the proportion of adult males is higher (27·7 per cent.) in Ireland than in England and Wales (26·3 per cent.) or Scotland (25·7 per cent.). The explanation is probably to be found in the comparatively large number of uncontested seats resulting in diminished activity by the agents of the different parties.

Assuming that each "person" referred to in column 3 is a separate individual, these figures show that in England and Wales about one in three, in Scotland about three in eight, and in Ireland about four in nine, of the adult male population are not on the parliamentary register, and therefore are unable to exert any influence through the ballot-box. They may take part in processions, swell mobs, and break up meetings; they may assist candidates in canvassing or in the committee rooms; but they cannot exercise the prime duty of every citizen—they may not vote.

The most cursory acquaintance with these figures shows,

however, that the number of so-called "persons" is very considerably exaggerated by the inclusion both of duplicate and of plural voters.

In the first place the number of "persons" on the register is not the same as the number of individual electors. To obtain this number a deduction should be made for plural voters, *i.e.*, electors entitled to vote in more than one constituency. It is, of course, difficult to ascertain this number with even approximate precision. In the last Return of Parliamentary Constituencies (Cd-4975) the following categories of electors other than occupiers are given, *viz.* :—

Owners	608,270
Freemen, freeholders, &c.	52,662
University	48,154
<hr/>	
Total	708,486
<hr/>	

It is frequently assumed that this number represents the plural voters, and some attempt to enlarge even this total by the number of persons with an occupation vote in more than one constituency. I do not claim to have exhausted this question, which is a very fruitful one deserving further inquiry ; but, so far as I can ascertain, it would be seriously misleading to assume that the number of "out-voters" is even approximately equal to the total of 708,486. It would, of course, be generally admitted that nearly all the University electors are plural voters. On the other hand, very few of the "freemen, &c.," would be out-voters, since the law requires that a freeman must reside within seven miles of the place where he is registered. This limitation would have the effect, therefore, of disentitling nearly all freemen other than those residing in the constituency from being put on the register. It is, however, with regard to the ownership vote that the greatest doubts prevail. A large number of the so-called ownership voters are really occupiers—persons owning their own freeholds, whether it be house, farm, or allotment. The number of genuine out-voters is, therefore, likely to be considerably fewer than the number given in the ownership column. I assume in the present Paper that the number is 450,000.

Deducting this number from the total of names on the register, there are left about 7,245,000 individual electors entitled to vote. The number of male adults who may not vote because their names are not on the register amounts, therefore, to about 4,665,000.

How is this number composed? What are its constituent elements? To a certain extent it is due to actual disfranchisement of certain individuals (*e.g.*, paupers, servants living on employer's premises, removals, &c.); and, to a certain extent, also to the non-enfranchisement of certain other classes (*e.g.*, aliens). These

categories can be shown to account for a very considerable proportion of the 4,665,000 adult male non-electors.

Paupers.—With regard to the number of paupers, it may be noted that, according to the Pauper Census (H.C. 250/1908), 4·8 per cent. of the adult male population in England and Wales received relief which would have disqualified the recipient from being put on the register in the year ending September 30, 1907. "Adult male" in the pauper census means males aged 16 and upwards. Having regard to the small number of paupers between 16 and 21, it may be reasonably assumed that of the male population over 21 the proportion is not less than 5 per cent. Since the estimated adult male population at the beginning of 1910 is officially given for England and Wales at 9,440,000, the probable number of paupers is about 472,000.

Foreigners.—The number of adult male aliens enumerated in England and Wales at the last census was 125,303. Assuming a rate of increase slightly greater for aliens than among the general population, it is probable that the present adult male aliens is nearly 150,000 in England and Wales.

Male domestic servants.—According to the last census, there were 250,320 adult males engaged in the domestic services. These include coachmen, gardeners, &c., many of whom do not live on the same premises as their employers. But by far the larger proportion of the men-servants do; and it is certain that this proportion could not have been less than 80 per cent. of the total at the time. The number of persons disqualified by reason of living on their employer's premises could not have been less than 187,700 in 1901, and at the present time must amount to about 205,000.

Barracks, quarters, prisons, &c.—There were at the time of the last census 114,950 persons returned as living in military and naval barracks, quarters, hospitals, prisons, and His Majesty's ships in Home waters. The military and naval barracks were at the time (1901) depleted on account of the war; on the other hand these figures include a certain number of males under 21. It may be assumed therefore that this number is approximately the present adult male population of these institutions. It is estimated that not more than one-fifth of these persons are entitled to be on the register, leaving therefore almost exactly 90,000 adult males towards the difference here investigated.

Defectives.—The number of defective persons (*i.e.*, deaf, dumb, blind, epileptic, &c.) at the last census was 80,531, or about 9·4 per 1,000 adult males. The same proportion of the present adult male population is 93,400.

Removals.—By far the largest single item in this enumeration is the number of persons who lose their votes by reason of removal. According to one of the leading Conservative election agents, I am assured that in the English county seats the number of electors who leave the constituency every year averages about 5 per cent., and in the boroughs is approximately 25 per cent. Another election agent, with very wide experience of different kinds of constituencies in many parts of the country, puts the proportions at 6 per cent. and 20 per cent. respectively. The former would represent an annual loss by removals of 756,000, the latter of 664,000; the mean of these two estimates is 710,000.

Collecting these various estimates, and assuming there is no overlapping, we obtain a total of 1,720,000 adult males who are not legally entitled to vote; thus:—

Paupers	472,000
Foreigners	150,000
Domestics	205,000
Barraacks, &c.	90,000
Defectives	93,000
Remora's	710,000
	<hr/>
	1,720,000

This is the total for England and Wales, and represents 18·2 per cent. of the adult male population. A similar proportion for the whole of the United Kingdom gives a total of 2,170,000. This accounts for about one-half of the adult males not on the register. The other half is probably entirely accounted for by lodgers, the majority of whom are not electors, and the indifferentists who do not trouble to get themselves put on the register, though fully qualified by residence, nationality, non-receipt of poor relief, &c. It should be noted, further, that it is here tacitly assumed that, as soon as a person reaches 21, he claims his vote. The probabilities are that the average age of persons who come on the register for the first time is several years higher; and, seeing that each year accounts for an additional 350,000 to 400,000 adult males, it is clear that a large part of the balance must be composed of these young men. Be this as it may, if this analysis be even approximately correct, it would appear that, without any extension of the existing law, about 2,000,000 voters could be added to the register if the citizen could be induced to take greater interest in the franchise and in its proper exercise at election times.

The question which might be appropriately considered next is the manner in which the voters exercised their powers at the last

election. The parliamentary system is, in this country, based on the party system. It is, therefore, pertinent and important to inquire:—

- (i) how the votes were cast in support of the different parties ;
- (ii) into the geographical distribution of party votes ;
- (iii) what changes were manifested in the votes compared to last preceding election ;
- (iv) what were the majorities by which successful members were returned ;
- (v) how far the present House of Commons might be regarded as completely representative of the nation's political views ?

Incidentally, and in the course of these inquiries, other subjects will be referred to, such as, for example, the effect of three-cornered contests in interfering with an accurate representation in Parliament of the political views of the country.

Adjustments for "two-member" seats.

Before any figures of "votes polled" are given, it is necessary to explain the method adopted throughout this Paper (unless otherwise definitely stated) for dealing with "two-member" constituencies. During the course of the elections many journals vied with one another in their versions of the aggregate of votes polled for the different parties. The large differences between these versions were due in part to arithmetical errors, but largely also to differences in their treatment of this problem. The importance of this adjustment may be gathered from the fact that the electorate in "two-member" seats in the United Kingdom is 518,877, or 6·7 per cent. of the entire electorate. Every voter in a contested election is entitled to record two votes; and, therefore, measured by potential voting strength, the "two-member" seats represent an aggregate of 1,037,754 votes, or 12·6 per cent. of the potential voting strength. Thus to give the same weight to voters in all constituencies, whether returning one or two members, would appreciably affect our calculations. A precise correction is, of course, impossible, because it is impossible to ascertain how many of these voters exercised their full right to record two votes. An adjustment which is probably very approximately true may, however, be made on the following assumptions. I regard a contest in a seat returning two members as two contests taking place simultaneously, in which, for convenience, each elector polls for different candidates by means of one voting paper. To put him on an equality with electors in other seats returning only one member, a voter in a "two-member" seat, where there are two candidates of his political colour, is assumed to give a vote of one-half to each of those candidates. The actual Unionist vote for the two

Unionist candidates will, therefore, be one-half the aggregate votes polled by them. The same applies in the case of two Liberal candidates, or a Liberal and Labour member. Where there was only one Liberal candidate, as in the City of London, it is assumed that Liberal voters gave their entire vote for their candidate, a fact which is supported by the approximate equality of the votes given for each of the two Unionist candidates. Again, where there were more than two Liberal and Labour candidates, as at Preston, the Liberal vote is taken as one-half the total vote given for all three of these candidates, though in this case some Unionist voters might have supported the Independent Liberal on his personal merits. This method of adjustment departs in some important respects from that adopted by Sir A. Baines in his paper; but I hope it may commend itself to his critical judgment.

Areas.

Still another observation is necessary before the actual study of the figures is entered upon. For convenience in examining the results, the constituencies are divided into ten large geographical areas. Wales, Scotland and Ireland represent three of these divisions, and England is split up in seven divisions. In each case, also, a further sub-division is made between boroughs (or burghs) and counties. The divisions chosen for England are those into which the country was formerly divided for political work by the National Union of Conservative Associations. They have been adopted here, because they appear to me convenient, and, so far as I can discover, do not bias in any way the statistical results presented in this Paper.

The divisions respectively include the following counties, and for reference the electorates in the county constituencies and boroughs are added:—

England—

1. *Northern Division* (Cumberland, Durham, Northumberland, Westmorland). Electorate—counties, 258,386; boroughs, 172,208; total, 430,594.
2. *Yorkshire, Lancashire, and Cheshire.* Electorate—counties, 877,345; boroughs, 752,556; total, 1,629,901.
3. *Midland Division* (Derby, Hereford, Rutland, Salop, Stafford, Northampton, Nottingham, Leicester, Worcester, Warwick). Electorate—counties, 590,771; boroughs, 391,287; total, 982,058.
4. *Eastern Division* (Norfolk, Lincoln, Suffolk, Huntingdon, Cambridge). Electorate—counties, 251,363; boroughs, 97,073; total, 348,436.

5. *Home Counties* (Bedford, Berks, Buckingham, Essex, Hants, Herts, Kent, Middlesex, Oxford, Surrey, Sussex, and Isle of Wight). Electorate—counties, 957,946; boroughs, 186,303; total, 1,144,249.

6. *Metropolitan Division* (Metropolitan Boroughs, West Ham, and Croydon). Electorate—722,417.

7. *Western Division* (Somerset, Devon, Cornwall, Gloucester, Monmouth, Dorset, Wilts). Electorate—counties, 442,130; boroughs, 144,261; total, 586,391.

Wales.—Electorate—counties, 247,335; boroughs, 110,231; total, 357,566.

Scotland.—Electorate—counties, 450,950; boroughs, 311,234; total, 762,184.

Ireland.—Electorate—counties, 568,464; boroughs, 115,303; total, 683,767.

The 1910 General Election.

We are now in a position to submit the results themselves, and these are summarised in the following table:—

TABLE 2.—*Votes polled, members returned, and electorates in contested seats at General Election, 1910.*

[The black figures in brackets give the number of members returned.]

Division.	COUNTIES.				
	Electorate.	Votes polled and members returned.			
		Unionist.	Liberal.	Labour, &c	Total.
<i>a. England—</i>					
1. Northern	233,617	76,438 (4)	92,667 (10)	29,126 (2)	198,231 (16)
2. Yorks, Lanes and Cheshire	877,345	340,360 (17)	349,388 (33)	86,222 (7)	775,970 (57)
3. Midlands	578,893	256,065 (22)	214,517 (14)	41,226 (5)	511,808 (41)
4. Eastern	251,363	110,389 (12)	110,090 (11)	—	220,479 (23)
5. Home counties	957,946	481,799 (50)	349,149 (6)	—	830,948 (56)
6. Metropolitan	—	—	—	—	—
7. Western	442,130	187,460 (16)	192,592 (21)	13,533 (1)	393,585 (38)
Total	3,341,324	1,452,511 (121)	1,308,403 (95)	170,107 (15)	2,931,021 (231)
<i>b. Wales.....</i>	247,335	61,293 (1)	110,217 (15)	33,360 (3)	204,870 (19)
<i>c. Scotland.....</i>	450,950	151,728 (5)	207,169 (34)	17,824 (0)	376,721 (39)
Great Britain	4,039,609	1,665,532 (127)	1,625,789 (144)	221,291 (18)	3,512,612 (289)

TABLE 2. *Contd.—Votes polled, members returned, and electorates in contested seats.*
[The black figures in brackets give the number of members returned.]

Division.	BOROUGHs (OR BURGHS).				
	Electorate.	Votes polled and members returned.			
		Unionist.	Liberal.	Labour, &c.	Total.
<i>a. England—</i>					
1. Northern	169,607	63,935 (3)	62,900 (9)	19,824 (1)	146,659 (13)
2. Yorks, Lanes and Cheshire	752,556	291,051 (19)	270,352 (33)	107,193 (13)	668,596 (65)
3. Midlands	378,974	176,421 (20)	129,297 (11)	28,958 (3)	334,676 (34)
4. Eastern	94,256	41,156 (3)	38,384 (7)	5,500 (1)	85,100 (11)
5. Home counties	186,303	92,252 (18)	65,512 (3)	7,895 (0)	165,739 (21)
6. Metropolitan	722,417	321,169 (34)	251,361 (26)	30,747 (2)	603,277 (62)
7. Western	144,261	62,353 (11)	65,344 (6)	2,255 (0)	129,952 (17)
Total	2,448,374	1,048,337 (108)	883,230 (95)	202,432 (20)	2,133,999 (223)
<i>b. Wales</i>	110,231	35,832 (1)	52,520 (9)	10,191 (1)	98,543 (11)
<i>c. Scotland</i>	311,234	103,861 (4)	146,017 (25)	18,078 (2)	267,956 (31)
Great Britain	2,869,839	1,188,030 (113)	1,081,767 (129)	230,701 (23)	2,500,498 (265)
COUNTIES AND BOROUGHS (OR BURGHS).					
<i>a. England—</i>					
1. Northern	403,254	140,373 (7)	155,567 (19)	48,950 (3)	344,890 (29)
2. Yorks, Lanes and Cheshire	1,629,901	631,411 (36)	619,740 (66)	193,415 (20)	1,444,566 (122)
3. Midlands	957,867	432,486 (42)	343,814 (25)	70,184 (8)	846,484 (75)
4. Eastern	345,619	151,545 (15)	148,474 (18)	5,560 (1)	305,579 (34)
5. Home counties	1,144,249	574,051 (68)	414,741 (9)	7,895 (0)	996,687 (77)
6. Metropolitan	722,417	321,169 (34)	251,361 (26)	30,747 (2)	603,277 (62)
7. Western	586,391	219,813 (27)	257,936 (27)	15,788 (1)	523,537 (55)
Total	5,789,698	2,500,848 (229)	2,191,633 (190)	372,539 (35)	5,065,020 (454)
<i>b. Wales</i>	357,566	97,125 (2)	162,737 (24)	43,551 (4)	303,413 (30)
<i>c. Scotland</i>	762,184	255,589 (9)	353,186 (59)	35,902 (2)	644,677 (70)
Great Britain	6,909,448	2,853,562 (240)	2,707,556 (273)	451,992 (41)	6,013,110 (554)

The first observation on the foregoing table is that whereas the electorate (measured by the number of names on the register) in the contested seats in England numbered about 16 times that of Wales, the number of members returned was only about 15 times as large. Similarly, the English electorate is about $7\frac{1}{2}$ times that of the Scottish, yet the members returned were only $6\frac{1}{2}$ times as large. There is thus apparent at the outset a want of uniformity in the relation of electorates to members, which is more strikingly summarised in the following table relating to the whole of the United Kingdom (except the Universities), and covering both contested and uncontested seats:—

	England.	Wales.	Scotland.	Ireland.	United Kingdom.
1. Number of members	460	30	70	101	661
2. Electorate (1910)	5,844,046	357,566	762,184	683,767	7,647,563
3. Adult male population (January 1, 1910)	(8,897,000)	(543,000)	1,261,572	1,210,046	11,911,618
4. Total population	34,055,000	1,996,000	4,903,000	4,376,000	45,240,000
5. Electorate per member	12,704	12,522	10,888	6,770	11,570
6. Adult male population per member	19,340	18,100	18,025	11,981	18,021
7. Total population per member	74,000	63,500	70,000	43,300	68,400
Number of members if returned in proportion to—					
8. Electors	505	31	66	59	661
9. Adult males	494	30	70	67	661
10. Total population	498	28	71	64	661

Thus, if members were returned in proportion to numbers, and the total representation in the House of Commons were fixed, England would be represented by 45 additional members if the criterion be one of electors, by 34 additional members on the basis of adult male population, and by 38 members if the basis were equality of population per member. The same tests would reduce the Irish representation by 42, 34 and 37 members respectively. Wales and Scotland would continue to send the same number of members if the criterion were adult male population, but would have their representations increased by 1 and reduced by 4 members respectively on the basis of electorates, while on a basis of total population Wales would send 2 less members and Scotland 1 more. The differences produced by these varying criteria are, of course, due to the fact that larger proportions of the adult males are

TABLE 3.—*Ratio of polls to electorates and distribution of votes among parties.*

Division.	COUNTIES.				BOROUGHs (OR BURGHs).				COUNTIES AND BOROUGHs (OR BURGHs).			
	Percentage of total electorate polled.	Proportion of total votes given for			Percentage of total electorate polled.	Proportion of total votes given for			Percentage of total electorate polled.	Proportion of total votes given for		
		Unionist.	Liberal.	Labour, &c.		Unionist.	Liberal.	Labour, &c.		Unionist.	Liberal.	Labour, &c.
<i>a. England—</i>												
1. Northern	84.8	38.6	46.7	14.7	86.5	43.6	42.9	13.5	85.5	40.7	45.1	14.2
2. Yorks, Lanes and Cheshire	88.4	43.9	45.0	11.1	88.8	43.5	40.4	16.0	88.6	43.7	42.9	13.4
3. Midlands	88.4	50.0	41.9	8.1	88.3	52.7	38.6	8.7	88.4	51.1	40.6	8.3
4. Eastern	87.7	50.1	49.9	—	90.3	48.4	45.1	6.5	88.4	49.6	48.6	1.8
5. Home counties	86.7	58.0	42.0	—	89.0	55.7	39.6	4.8	87.1	57.6	41.6	0.8
6. Metropolitan	—	—	—	—	83.5	53.2	41.7	5.1	83.5	53.2	41.7	5.1
7. Western	89.0	47.6	48.9	3.4	90.1	48.0	50.3	1.7	89.3	47.7	49.3	3.0
Total	87.7	49.6	44.6	5.8	87.2	49.1	41.4	9.5	87.5	49.4	43.3	7.4
<i>b. Wales</i>	82.8	29.9	53.8	16.3	89.4	36.4	53.3	10.3	84.9	32.0	53.6	14.4
<i>c. Scotland</i>	83.5	40.3	55.0	4.7	86.1	38.8	51.5	6.7	84.6	39.6	54.8	5.6
Great Britain	86.9	47.4	46.3	6.3	87.1	47.5	43.3	9.2	87.0	47.5	45.0	7.5

disqualified from the exercise of the parliamentary vote in Wales, Scotland and Ireland than in England.

This disproportion between electorates and members is, however, not confined to the four kingdoms; it is equally apparent in the divisions of England. For example, 403,254 electors in the Northern Division returned 29 members, whereas 345,619 electors in the Eastern Division returned 34 members, the former giving an average of 13,905 electors, and the latter 10,165 electors per member. Similarly, Lancashire, Yorkshire and Cheshire members represent an average electorate of 13,360, whereas the Western members have an average constituency of 10,662 electors. This inequality in the size of different constituencies, leading to the numerical under-representation in different parts of the kingdom, has led to a cry for redistribution, on the plea that members should represent constituencies of approximately equal size. This plea is further examined elsewhere in this Paper.

Attention might appropriately next be drawn to the questions of the proportions of the electors who voted in the different areas, and how these were distributed among each of the leading political parties. This examination should supply some information about the political "temperature"—the keenness in different parts of the country for political matters—and the political "colour" of the electors. The figures are summarised in the table on the preceding page.

Political "temperature."

The intensity of political feeling, as manifested by the proportions of the electorates proceeding to the polls, was exceptionally great. This is shown by the fact that in all the contested seats of Great Britain 87 per cent. of the electorate voted. No appreciable difference was manifested between the counties and the boroughs (or burghs). In England 87·5 per cent. voted, in Wales 84·9 per cent., and in Scotland 84·6 per cent. The lowest proportion was found in the Welsh county seats, and the highest proportion in the boroughs of the Eastern and Western Counties. The low proportion—83·5 per cent.—for the Metropolitan area calls for some explanation.

These results appear, at first sight, very strange. It might have been reasonably assumed that in the crowded centres, like those of the Metropolis, where opportunities for political education are so much greater than in other parts of the country, where newspapers are abundant, where the difficulty of recording votes is less than elsewhere, and where the supply of motor cars is especially abundant, the temperature would have risen to a high degree, and the reading on the political thermometer would have approximated

to boiling point or 100 per cent. Does the number of voters who poll depend in any degree on whether the constituency is scattered or not? Does it depend on the size of the electorates, so that each voter regards his individual vote of less consequence than in a small constituency? Or does it depend on the anticipated closeness of the contest? Such questions might be regarded as speculative, and definite answers difficult to obtain. These matters are, however, susceptible of further analysis on the following lines.

Density of electorate and percentage polled.

To investigate if any relation existed between the percentage of an electorate who polled, and the extent to which the electorate was scattered over a greater or smaller area, the following method was adopted:—In the case of every county constituency in England the area as given in the census of 1901 was taken, and the electors per square mile (called in this Paper the electoral density) calculated. This quantity was then related to the percentage who polled, and the correlation coefficient calculated. The boroughs were omitted from this part of the investigation as, *à priori*, it was to be expected that the differences in electoral density, such as might be shown in different towns, would probably not, in themselves, account for differences in the proportions who polled. The correlation coefficient thus calculated was

$$- 0.18 \pm 0.04.$$

The correlation coefficient is thus small. But, so far as it points any lesson at all, it appears that as county constituencies increase in density of electorate, and therefore of population, there is a general tendency for a diminution in electoral fervour sufficient to draw voters to the poll. This is disappointing, for it would seem to show that as the population increased, then, other things being equal, the proportion who were sufficiently interested to vote might be expected to diminish. The coefficient is, however, so small, and the probable error so large, that no definite reliance can be placed on this conclusion. By way of illustrating this movement, the following cases are given for the twelve English county constituencies having the largest, and the twelve having the smallest, electoral densities, and the proportion who polled in each case:—

	Smallest density.			Greatest density.	
	Electorate per square mile.	Per-centage poll.		Electorate per square mile.	Per-centage poll.
Hexham	10	88·7	Middlesex, Tottenham	4,180	82·3
Montgomeryshire ...	10	89·1	Essex, Walthamstow	2,794	85·0
Yorks, Richmond ...	12	89·7	Lanes, Gorton	2,596	83·3
Appleby	12	93·2	Middlesex, Hornsey ...	2,354	87·7
Radnorshire	13	74·2	„ Ealing	1,672	84·3
Merionethshire	14	84·8	Lanes, Stretford ..	1,381	85·2
Berwick	17	88·5	„ Bootle	1,328	78·7
Brecknockshire	18	75·9	Surrey, Kingston	1,092	85·2
Denbighshire, West	18	87·5	Yorks, Shipley	1,021	88·9
South Molton	19	89·9	Middlesex, Brentford	941	84·5
Cardiganshire, } West	19	82·1	Lanes, Prestwich ...	851	89·2
Ludlow	19	86·7	Staffs, Handsworth ...	851	83·2
Average	—	85·9		—	84·8

Size of constituencies and poll.

The question whether any relation subsisted between size of electorate and the percentage polled was similarly investigated. In this case all the 412 single member constituencies in England were tabulated. The result in this case was to establish a more definite correlation between size of constituency and size of poll. The correlation coefficient* worked out to

$$- 0·22 \pm 0·03;$$

that is, the correlation is negative, larger constituencies producing relatively smaller polls. This marked relation is further illustrated by the following figures for the twelve largest and smallest constituencies in Great Britain:—

Name.	Twelve smallest constituencies.		Name.	Twelve largest constituencies.	
	Electorate.	Poll (per cent.).		Electorate.	Poll (per cent.).
Whitehaven	3,050	93·9	Romford	52,984	83·8
St. George's East	3,133	86·2	Walthamstow	39,117	85·0
Winchester	3,200	93·7	Wandsworth	38,523	82·9
Windsor	3,210	93·7	Harrow	35,379	85·7
Penryn and Falmouth	3,215	93·5	Tottenham	29,260	82·3
Salisbury	3,386	97·1	Handsworth	28,937	83·2
Grantham	3,617	97·4	Enfield	28,571	84·0
Pontefract	3,661	93·9	Wimbledon	27,810	84·1
Taunton	3,814	90·3	Stretford	27,629	85·2
King's Lynn	3,755	94·2	Croydon	27,350	86·1
Canterbury	3,836	92·2	South West Ham	26,682	70·1
Whitechapel	3,986	84·4	Tyneside	25,667	81·7
Average	3,494	92·5		32,326	82·8

* See also Appendix, p. 509.

There are doubtless many causes which influence the size of a poll, but this investigation points to one important one, affecting the result in a very marked degree, being found in the size of the electorate. If further investigation should prove this contention a valid one, it would prove a serious objection to the proposals of those electoral reformers who favour larger electorates than at present returning several members. For one of the consequences which must apparently be anticipated from the adoption of such a reform in our electoral system is that a smaller proportion of the electors than before would proceed to the polls. The reason for this result would appear to be that in a small constituency every voter is directly canvassed, and is made to feel that his vote is of great and perhaps decisive importance in the result. Where the constituency is a large one he feels his vote is of less value; it can be more readily sacrificed without affecting the main result; and he is less willing to put himself to any inconvenience to record his vote. It would be a poor return for the adoption of a theoretically more perfect electoral system if it led to greater carelessness in the use of the franchise itself.

The question whether the size of the poll is related to the anticipated closeness of the result is dealt with in another connection in another part of this paper.

Returning to Table 3 another striking fact is seen to emerge from an examination of the figures in the steady increase of the votes polled by the Unionist candidates as we proceed from the North downwards. In the Scottish county and burgh divisions the proportion is exceedingly low, amounting to 40·3 per cent. of the valid votes polled in the county divisions, and only 38·8 per cent. in the burghs, giving an average of 39·6 per cent. throughout Scotland. In the Northern Counties the percentage rises to 40·7, in Yorkshire, Lancashire and Cheshire to 43·7, in the Western Counties to 47·7, in the Eastern Counties to 49·6, in the Midlands to 51·1, in the Metropolitan area to 53·2, and in the Home Counties to 57·6. This territorial distribution of party feeling is probably the result of no accident. Votes are probably generally given or, at any rate, are powerfully influenced, in accordance with the voters' conceptions of how their immediate interests are likely to be affected by the policies of the parties seeking their support. There are, doubtless, some who take a broader view of a political situation, and are anxious about broad principles of policy, reflecting on whether those policies will affect well or ill the future of the country, or the Empire as a whole. It is not likely, however, that these are sufficiently numerous to exercise any large determining influence on the

general results of a general election. Questions like the Budget of 1909-10, social reform, tariff reform, old age pensions are probably far more potent in deciding a general election than any number of abstract questions like the House of Lords' Veto or a two-chamber system, or than more remote questions like Socialism or the Empire situation. It is, of course, not suggested that these last topics have no influence at all, but that their respective influences are much less powerful than those in which the voters are more nearly and immediately concerned. If this analysis be correct, it follows that the result of the last election was to demonstrate that in the whole of Great Britain lying North of the Severn and Trent there was a majority of the voters opposed to the policy of the Unionist party, or who preferred the policy of their opponents. On the contrary, South of this line the majority of the electors were opposed to the policy of the Government, or preferred the policy of the Unionist party.

This conclusion as to progressive territorial distribution of party feeling is further strengthened by the following analysis of the distribution of the majorities in the various areas:—

TABLE 4.—*Average majorities in contested seats in the United Kingdom in 1910.*

	Aggregate majorities.			Number of seats.			Average majority.
	Single seats.	Double seats.	Total.	Single seats.	Double seats.	Total.	
ENGLAND.							
<i>Northern division.</i>							
Counties—							
Unionist	2,071	—	2,071	4	—	4	518
Non-Unionist	36,970	—	36,970	12	—	12	3,081
Boroughs—							
Unionist	336	1,546	1,882	1	2	3	627
Non-Unionist	10,446	8,886	19,332	8	2	10	1,933
<i>Yorks, Lanes and Cheshire.</i>							
Counties—							
Unionist	20,537	—	20,537	17	—	17	1,208
Non-Unionist	96,369	—	96,369	40	—	40	2,409
Boroughs—							
Unionist ..	8,197	3,717	11,914	16	3	19	627
Non-Unionist	53,884	37,851	91,735	35	11	46	1,994
<i>Midland division.</i>							
Counties—							
Unionist	37,742	—	37,742	22	—	22	1,716
Non-Unionist	37,420	—	37,420	19	—	19	1,969
Boroughs—							
Unionist ..	40,308	—	40,308	20	—	20	2,015
Non-Unionist	12,218	17,889	29,107	8	6	14	2,079

TABLE 4. *Contd.*—Average majorities in contested seats in 1910.

	Aggregate majorities.			Number of seats.			Average majority.
	Single seats.	Double seats.	Total.	Single seats.	Double seats.	Total.	
ENGLAND— <i>contd.</i>							
<i>Eastern division.</i>							
Counties—							
Unionist	6,875	—	6,875	12	—	12	573
Non-Unionist	6,576	—	6,576	11	—	11	598
Boroughs—							
Unionist	1,307	—	1,307	3	—	3	436
Non-Unionist	2,895	6,114	9,009	4	4	8	1,126
<i>Home counties division.</i>							
Counties—							
Unionist	138,905	—	138,905	50	—	50	2,778
Non-Unionist	6,255	—	6,255	6	—	6	1,043
Boroughs—							
Unionist	11,272	15,755	27,027	14	4	18	1,502
Non-Unionist	207	1,960	2,167	1	2	3	722
<i>Metropolitan division.</i>							
Unionist	51,783	25,963	77,746	32	2	34	2,287
Non-Unionist	23,538	—	23,538	28	—	28	841
<i>Western division.</i>							
Counties—							
Unionist	16,973	—	16,973	16	—	16	1,061
Non-Unionist	35,400	—	35,400	22	—	22	1,609
Boroughs—							
Unionist	2,435	960	3,395	7	4	11	309
Non-Unionist	5,493	752	6,245	4	2	6	1,041
WALES.							
Counties—							
Unionist	14	—	14	1	—	1	14
Non-Unionist	82,298	—	82,298	18	—	18	4,572
Boroughs—							
Unionist	8	—	8	1	—	1	8
Non-Unionist	13,728	19,777	33,505	8	2	10	3,351
SCOTLAND.							
Counties—							
Unionist	2,007	—	2,007	5	—	5	401
Non-Unionist	54,706	—	54,706	34	—	34	1,609
Boroughs—							
Unionist	1,592	—	1,592	4	—	4	398
Non-Unionist	43,591	12,008	55,599	25	2	27	2,059

Again, it will be noted that in Scotland the average Unionist majority was 401 in the counties and 398 in the burghs, against 1,609 for non-Unionists in the counties and 2,059 in the burghs. In the Northern Counties of England the Unionist majorities averaged 518 in the counties and 627 in the boroughs, against

3,081 for the non-Unionists in the counties and 1,933 in the boroughs. As we proceed southwards there is a marked tendency for the size of the average Unionist majority to increase, and for the non-Unionist majority to diminish. In the Midland division, Unionist and non-Unionist majorities attain an average of comparative equality. In the Home Counties and the Metropolis the Unionist majorities are as pronounced as the non-Unionist majorities in the North.

Size of constituency and political "colour."

A question of some interest arising from these figures is whether there is any real relation, such as is frequently alleged, between the size of a constituency and its political "colour." Is it true that large constituencies are usually Liberal and small constituencies usually Unionist? To answer this question, the correlation coefficient has been calculated between size of electorate and percentage of total poll given to the Unionist candidate. The result is to give for this coefficient¹ the value

$$- 0.16 \pm 0.03.$$

This result is obviously indefinite. The probable error is about one-third of the coefficient. So far as it goes it does seem to point to a very small negative correlation between size of constituency and Unionism. As constituencies increase in size there is apparently a very slight tendency for the strength of Unionism to diminish. It is, of course, possible that what is here attributed to mere size is really due to urbanisation, and that in the urban and manufacturing centres opposition to Unionism gathers strength.

The factor which more than any other appears to determine the size of the poll is the possibility of success or avoidance of defeat. The closer the anticipated result, the more strenuous will be the exertions of the agents of each party to bring every supporter to the poll. There will also be much greater keenness on the part of such voters in such cases to come from a distance, and for the ordinary resident voter to sacrifice some convenience to register votes when the contest is a close one, and the result is somewhat uncertain.

There is, of course, no real measure of "anticipation," and it has frequently happened that a majority which was anticipated by the agent and supporters of one of the candidates at several thousands has turned out on the day of election at less than so many hundreds, and in some cases there has resulted no majority at all. Nevertheless, though anticipations are liable to disappointment, it is fair to assume that this is approximately measured by the realised

¹ See also Appendix, p. 509.

majority. The correlation coefficient has therefore been calculated between majority (expressed as percentage of total poll) and the total poll as a percentage of the electorate. The result ² is
 -0.51 ± 0.03 .

There is thus substantial evidence in favour of the theory that large polls and small majorities go together. Keenness in political contests becomes greatest, and the temperature reaches a maximum in the constituencies where the parties are nearly equally divided. It is, of course, probable that in large constituencies the result, other things being equal, is more uncertain than in small ones, and this should have some effect in increasing the poll. But it has been already shown that large constituencies are accompanied by small polls, and therefore we appear to be left with the only possible conclusion that if the object of an electoral system is to increase the interest of an elector sufficiently in a political contest to trouble to record his vote, an approximately equal division of parties should be provided.

The following list of results for the constituencies with the twelve relatively smallest and the twelve largest majorities illustrates the result arrived at:—

Seats with smallest majority ratios.	Ratio of majority to poll.	Ratio of poll to electorate.	Seats with largest majority ratios.	Ratio of majority to poll.	Ratio of poll to electorate.
	Per cent.	Per cent.		Per cent.	Per cent.
Jarrow	0.5	79	Birmingham, N.	68	73
Eskdale	0.4	81½	Kensington, S.	63	77
Darlington	0.3	95	Liverpool (Scotland) ..	58	70
Gateshead	0.3	87	Aston Manor	59	78
Exeter	0.3	94	Birmingham, C.	56	78
Hull, Central	0.3	88	Strand	50	81
Islington, N.	0.3	87	Mansfield	48	81
St. Pancras, W.	0.1	83	Bewdley	47	84½
Droitwich	0.1	90	Edgbaston	47	81
Hyde	0.1	93	Rotherham	45	82½
Torquay	0.1	91	Bordesley	45	72
Leek	0.1	90	Normanton	44	77
	0.24	88		52½	78

Votes for winners and losers.

Another interesting question which might be well raised at this point is the relation between the numbers of votes cast for the successful and unsuccessful candidates respectively. This is shown classified according to the "colour" of the successful candidate, and by areas in the following table:—

² See also Appendix, p. 509.

TABLE 5.—*Votes for winning and losing candidates in single-member contested seats, classified according to results.*

	By Unionists.		By Liberals.		By Labour.		By Nationalists.		By Independent Nationalists.		Total.	
	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.
ENGLAND												
<i>Northern Division.</i>												
Counties	15,252	15,090	79,486	58,046	18,820	11,537	—	—	—	—	113,558	84,673
Boroughs	1,188	1,677	46,883	40,796	—	—	—	—	—	—	48,081	42,473
Total	16,440	16,767	126,379	98,842	18,820	11,537	—	—	—	—	161,639	127,146
<i>Yorkshire, Lancashire and</i>												
<i>Cheshire Division.</i>												
Counties	114,991	94,454	254,934	292,398	66,165	43,028	—	—	—	—	436,090	339,880
Boroughs	71,012	69,492	165,982	142,910	49,894	35,926	2,943	776	—	—	239,861	249,104
Total	186,003	163,946	420,916	345,308	116,059	78,954	2,943	776	—	—	725,951	588,984
<i>Midland Division.</i>												
Counties	140,640	102,898	111,619	85,406	41,226	30,019	—	—	—	—	293,485	218,323
Boroughs	116,293	75,985	41,264	34,043	9,199	5,202	—	—	—	—	166,756	115,230
Total	256,933	178,883	152,883	119,449	50,425	35,221	—	—	—	—	460,241	333,553
<i>Eastern Division.</i>												
Counties	57,805	50,930	59,160	52,584	—	—	—	—	—	—	116,965	103,514
Boroughs	11,101	9,794	16,922	16,156	—	—	—	—	—	—	28,023	25,950
Total	68,906	60,724	76,082	68,740	—	—	—	—	—	—	144,988	129,464
<i>Western Division.</i>												
Counties	84,112	67,377	125,453	100,303	13,295	3,045	—	—	—	—	222,860	170,725
Boroughs	23,460	21,025	27,386	24,148	—	—	—	—	—	—	50,846	45,173
Total	107,572	88,402	152,839	124,451	13,295	3,045	—	—	—	—	273,706	215,898

TABLE 5. *Contd.*—Votes for winning and losing candidates in single-member contested seats, classified according to results.

	By Unionists.		By Liberals.		By Labour.		By Nationalists.		By Independent Nationalists.		Total.	
	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.	Winning votes.	Losing votes.
<i>Home Counties.</i>												
Counties	414,213	275,308	73,841	67,586	—	—	—	—	—	—	488,054	342,894
Boroughs ..	50,206	40,284	5,264	5,057	—	—	—	—	—	—	55,470	45,311
Total	464,419	315,592	79,105	72,643	—	—	—	—	—	—	543,524	388,205
<i>London</i>												
Counties	195,180	146,266	119,549	95,116	18,671	13,267	—	—	—	—	326,400	254,619
<i>WALES.</i>												
Counties	2,222	2,208	108,009	45,657	33,360	13,414	—	—	—	—	143,591	61,279
Boroughs	2,438	2,430	42,366	30,089	—	—	—	—	—	—	44,804	32,519
Total	4,660	4,638	150,375	75,746	33,360	13,414	—	—	—	—	188,395	93,798
<i>SCOTLAND.</i>												
Counties	20,478	18,471	188,698	149,074	—	—	—	—	—	—	209,176	167,545
Boroughs	18,270	19,121	120,536	86,978	4,496	2,796	—	—	—	—	143,302	108,895
Total	38,748	37,592	309,234	236,052	4,496	2,796	—	—	—	—	352,478	276,440
Total Great Britain	1,338,891	1,012,810	1,580,362	1,236,347	255,126	158,234	2,943	776	—	—	3,177,322	2,408,167
<i>IRELAND.</i>												
Counties	29,917	25,421	3,238	3,136	—	—	25,936	19,514	—	—	84,591	66,512
Boroughs	14,482	9,881	—	—	—	—	16,109	9,914	—	—	30,591	19,795
Total	44,399	35,302	3,238	3,136	—	—	42,045	29,428	—	—	115,182	86,307
<i>UNIVERSITIES</i>												
Counties	12,709	8,032	—	—	—	—	—	—	—	—	12,709	8,032
Total United Kingdom	1,395,999	1,056,144	1,583,600	1,239,483	255,126	158,234	44,988	30,204	25,500	18,441	3,395,213	2,502,506

In Great Britain the votes polled for all the returned candidates in single-member seats totalled 3,177,322, while those given to all the unsuccessful candidates amounted to 2,408,167. These figures indicate, therefore, a clear average majority for all successful candidates in these constituencies of 1,514. The single-member seats now held by Unionists in Great Britain were won by an aggregate majority over all other candidates of 325,981, or an average majority of 1,449. Similarly the single-member Liberal seats in Great Britain have been won with an aggregate majority of 344,015, or an average majority of 1,365. The seats won for the Labour party show an aggregate majority of 96,892, or an average of 3,230 per member. The Liberal and Labour members combined show an average majority per member of 1,564. The only other point for comment in connection with the previous table is the fact that in the northern and the Scottish burghs the votes given for the successful Unionist candidates were less than those given for their unsuccessful opponents. This, of course, is due to the three-cornered contests at Whitehaven, Cockermouth and Glasgow (Camlachie) resulting in the return of members with a minority of voters in those constituencies.

Disproportion between electors, voters and members.

What has been stated already goes to show that on the basis either of voters or electorate, or even on population, the different parts of the United Kingdom are not fairly represented in the House of Commons; and that on the basis of the votes recorded for the different political parties, these parties are themselves unfairly represented. Assuming the appropriateness of these criteria, it is desirable to give the figures of representation which would be in strict consonance with them. To deal adequately with this subject it is first necessary to make some allowance for the distribution of parties in uncontested seats.

There were at the last general election 75 seats which were uncontested, viz. :—

	Number of seats.	Electorate.
England	6	54,318
Wales	—	—
Scotland	—	—
Ireland	63	420,304
Universities	6	19,060
	75	493,712

Three of the uncontested English seats were situated in the

northern area, where the poll averaged 85·5 per cent. of the electorate, and the remaining three were in the Midlands and eastern areas, where the poll averaged 88·4 per cent. of the electorate. It is reasonable to assume, therefore, that had there been contests in these divisions about 87·0 per cent. of the electorate would have recorded a vote. The votes which would have been given in these seats may be reckoned, therefore, as 87 per cent. of 54,348, or 47,283. The voting in seats which returned Unionists in the northern area showed a poll of about 50 per cent. for the Unionist; in the Midland area about 60 per cent.; and in the eastern area about 53 per cent. Seeing, therefore, that no contest was challenged by the Liberal party in the five seats in which Unionists were allowed a "walk-over" it must be assumed that at least 60 per cent. of the poll would have been given for the Unionists. The uncontested Liberal seat was in the northern area, where the average Liberal poll in seats won by the party was about 56 per cent. Here again, therefore, we may assume for this seat a poll of 60 per cent. for the Liberal candidate. It follows, therefore, that of the 47,283 votes which, it may be assumed, would have been recorded if there had been a contest, 25,615 would have been given for the Unionist candidates, and 21,668 for the Liberal candidates.

Next, in regard to Ireland, not even the above semblance of precision can be realised; there is nothing to guide us as to the relative strength of Unionist voting in Nationalist seats. Judging from other contested Irish seats, it might be reasonably assumed that under other circumstances 85 per cent. of the electorate would have polled, viz., 357,258, in the seats left uncontested. Inquiries made from those qualified to judge show that the Nationalist vote in unopposed Nationalist seats will probably vary from 3 to 4 to 1. The assumption here made, therefore, is the mean of these estimates, viz., 3·5 : 1. It is further assumed that two-thirds of the votes polled in unopposed Unionist seats in Ireland were Unionist. This gives a Unionist vote in unopposed Irish seats, if polling had taken place, of 107,601, and a Nationalist (including Liberal) vote of 249,657. The party voting in all seats contested and uncontested, may be, therefore, put as follows :—

	Votes polled.			Members returned.		
	Unionist.	Non-Unionist.	Total.	Unionist.	Non-Unionist.	Total.
England—						
Contested	2,500,848	2,564,172	5,065,020	229	225	454
Uncontested.....	25,615	21,668	47,283	5	1	6
Total	2,526,463	2,585,840	5,112,303	234	226	460
Wales—						
Contested	97,125	206,288	303,413	2	28	30
Uncontested.....	—	—	—	—	—	—
Scotland—						
Contested	255,589	389,088	644,677	9	61	70
Uncontested.....	—	—	—	—	—	—
Ireland—						
Contested	72,534	139,505	212,039	11	27	38
Uncontested.....	107,601	249,657	357,258	8	55	63
Total	180,135	389,162	569,297	19	82	101
Total United King- dom (except Uni- versities)	3,059,312	3,570,378	6,629,690	264	397	661

If the parties had been returned in strict proportion to the votes cast, the representation of these 661 seats in the Commons would have been 307 Unionists and 354 non-Unionists. The Unionist party is, on this assumption, under-represented to the extent of 43 seats, and all other parties are over-represented to the same extent.

Those who advocate a reform in the British electoral system which would allot members in proportion to the electorate, and which would return them in strict proportion to the votes given for the respective parties, might have looked for the following results:—

	Members actually returned.			Members under reformed system.		
	Unionists.	Non-Unionists.	Total.	Unionists.	Non-Unionists.	Total.
England	234	226	460	249	255	504
Wales	2	28	30	10	21	31
Scotland	9	61	70	26	40	66
Ireland	19	82	101	19	41	60
Total United Kingdom}	264	397	661	304	357	661

The small difference here shown for the extent of the under

representation of the Unionist and non-Unionist parties from that given previously is entirely due to the allotment of members to each division in proportion to the electorates instead of to votes. This has had the effect of reducing the Unionist calculated representation by 3 members, counting 6 on a division. Counting in the 9 University seats, all of which return Unionist members, the House of Commons would show, instead of an actual Unionist minority of 124, a minority of only 38 if seats were proportioned to votes polled, and 44 if seats are distributed in proportion to electorate, and members returned in proportion to votes for the different parties. The foregoing last table shows that, according to a strictly proportional system of representation, England would have returned 44 more members, 15 Unionists and 29 non-Unionists. This is distributed among the 7 electoral areas into which England has been divided for the purposes of the present Paper as follows:—

Area.	Electorate.	Members actually returned.		
		Unionists.	Non-Unionists.	Total.
Northern.....	430,594	9	23	32
Yorks, Lanes and Cheshire	1,629,901	36	86	122
Midlands.....	982,058	44	33	77
Eastern	348,436	16	19	35
Home counties	1,144,249	68	9	77
Metropolitan	722,417	34	28	62
Western	586,391	27	28	55
	5,844,046	234	226	460

Area.	Electorate.	Members under reformed system.		
		Unionists.	Non-Unionists.	Total.
Northern.....	430,594	15	22	37
Yorks, Lanes and Cheshire	1,629,901	62	79	141
Midlands.....	982,058	44	41	85
Eastern	348,436	15	15	30
Home counties	1,144,249	57	42	99
Metropolitan	722,417	33	29	62
Western	586,391	24	27	51
	5,844,046	249	255	504

The redistribution of seats in proportion to the electorate would provide more seats for each of the areas except the eastern and western counties, while it would leave the metropolis untouched. On the other hand, the additional reform represented by proportional representation would increase the Unionist membership in the northern counties and in Yorkshire, Lancashire, and Cheshire,

would leave it untouched in the Midlands, and would reduce it in the remaining areas. That is, there is a serious under-representation in the House of Commons of the Unionist strength in the electorate in the whole of the north of England, for whereas the actual number of Unionists returned in these areas is 45, redistribution and proportional representation combined should entitle them to 77; and the non-Unionist majority in the north of England, instead of being 64, would only be 24. On the other hand, the application of the same principles to other areas would show that the non-Unionists are seriously under-represented. In the Midlands the non-Unionist strength would be increased to 41 members, being but 3 short of the Unionist strength instead of 11, as at present. More striking still would be the effect on the representation in the home counties, for there, instead of but 9 non-Unionist members, one might expect 42.

It is sometimes claimed that redistribution, without the accompaniment of proportional representation, would in itself correct many of these anomalies. An examination of the above figures affords not a shadow of ground for this contention. What reason is there for supposing that if the 122 seats in Yorkshire, Lancashire, and Cheshire were increased to 141 that anything approaching the figures of 62 Unionists and 79 non-Unionists would take the place of 36 and 86 respectively returned at present? Even if the whole of the additional 19 seats were represented by Unionists, there would still be a serious under-representation of this party. Still more strikingly is this the case with the under-representation of the Liberal and Labour parties in the home counties.

These considerations receive support by an examination of the results in constituencies of approximately equal size. If the constituencies are grouped according to their electorates, it is possible to discover how far the admitted defects in the general results are observable also in the constituent groups. Do these anomalies arise mainly through some comparative over-representation of one of the parties in small, medium, or large constituencies; or does it reside in all classes? The answer is to be found in the following exceedingly interesting table, in which the results are classified according to the size of the electorate. The last three columns show in each group the number of members who would have been returned on a strictly proportional basis of representation.

The results are somewhat remarkable. In small seats (*i.e.*, small electorates), the numbers returned for the different parties are fairly proportionate to the number of voters. In seats of less than 5,000 electors there might have been 15 Unionists returned on a proportional basis instead of 14 under the present system; in seats of

TABLE 6.—*Votes polled in Great Britain in seats contested in 1910, grouped according to size of constituency.*

Constituencies with electorates	Number of constituencies.	Number of members.				Aggregate of electorates.	Total votes polled.				Members in proportion to votes in each area.		
		Unionist.	Liberal.	Labour, &c.	Total.		Unionist.	Liberal.	Labour, &c.	Total.	Unionist.	Liberal.	Labour, &c.
Under 5,000	30	14	16	—	30	114,315	51,888	51,548	825	104,261	15	15	0
5,000 to 10,000	137	70	63	5	138	1,111,036	463,867	463,780	35,723	963,370	66	66	5
10,000 „ 15,000	210	100	105	10	215	2,559,315	1,102,047	1,050,898	106,263	2,259,208	105	100	10
15,000 „ 20,000	96	29	57	14	100	1,657,417	653,867	601,386	184,469	1,439,722	45	42	13
Over 20,000	58	27	32	12	71	1,467,365	581,893	539,944	124,712	1,246,549	33	31	7
Total	531	240	273	41	554	6,909,448	2,853,562	2,707,556	451,992	6,013,110	263	249	42

5,000 to 10,000 there would have been 66 instead of 70. In the next group the present distribution of parties would have been completely inverted and instead of 100 Unionists and 105 Liberals there would have been returned 105 Unionists and 100 Liberals. The most extraordinary results appear in the next groups. According to the votes cast in constituencies of 15,000 to 20,000 electors there should have been returned 45 Unionists and 42 Liberals; instead there were returned 29 Unionists and 57 Liberals. Finally, in the largest seats (*i.e.*, electors over 20,000), instead of the 27 Unionists there would have been 33, and instead of 12 Labour members there would have been 7. Thus there are anomalies as striking and as serious from the strictly proportional representation point of view in the case of constituencies of approximately equal size as were previously noted in the general results. There appears no reason, therefore, to suppose that redistribution alone could or would remove these faults from our present electoral system.

Another fact which emerges from the last table is the striking under-representation in large seats. The 1,467,365 electors in the contested seats in Great Britain, each with an electorate of more than 20,000, returned 71 members; whereas 1,111,036 electors in seats of 5,000 to 10,000 electors returned 138 members. From the party point of view the contrast is even more striking. In the former group of large constituencies, 581,893 Unionist votes returned 27 Unionist members; whereas in the latter group of small constituencies, 463,819 Unionist votes returned 70 Unionist members. Similar comparisons might be made relating to Liberal votes and seats. Their general effect appears to be that the Unionist under-representation in large seats is to some extent compensated by an over-representation in small seats.

I am firmly persuaded, however, that it is not possible for redistribution alone to effect those particular reforms which the advocates of proportional representation urge.

Scheme of proportional representation.

It is scarcely within the strict province of a statistical paper to discuss the question of proportional representation as a scheme of electoral reform. Seeing, however, that some of the figures already produced have an important bearing on the question, it may be permitted to point out what are, I believe, some of the consequences involved in the adoption of this principle.

1. It would secure in the House of Commons a representation of each party in strict arithmetical proportion to the number of its supporters in the country. Redistribution can remove anomalies due to over-representation in one part and under-representation in

another part of the country. So far as the over-representation in one area is accompanied by an excessive proportion of members of one party, and the under-representation in another area is accompanied by a deficiency of members of the opposite party, redistribution might have some counterbalancing results. There is, however, no real security that redistribution by itself might not aggravate rather than mitigate this particular trouble.

2. Proportional representation would involve, however, a "revolution" rather than a "reform" in our existing system; not merely in the technique of electioneering, the manner of voting, selection of candidates, &c., but in the whole of those relations which subsist at present between a member and the electors of the constituency he represents. At present members fight their constituencies on party lines. But the party programme is an elastic one. Each candidate is prepared to treat with different sections of the electors, hear their views on controversial questions, suggest compromises, and give pledges to support the whole or part of the programme advocated by these sections. The process is an exceedingly salutary one in educating the candidates, bringing them into that close contact with the people which is regarded as indispensable to democratic government, and in making the party programme much less rigid and inflexible in its attitude to various measures. The member representing any constituency is always mindful, in the votes he gives in Parliament, of the interests of the minority as well as of the majority by whom he was returned. The displeasure of a comparatively small number of voters would involve his defeat on the next appeal for their suffrages. He is, in fact, the member for Blankshire, and not of a political section in that honourable constituency.

3. On the other hand, under any proportional representation scheme hitherto proposed, candidates would represent a "quota" of supporters. He will represent that "quota," and will be tempted to disregard the opinions of others who might not agree with the whole of his programme. There will be no necessity for judicial "trimming" of his views to those of the electors. The result may be that in the House of Commons itself the party policies will be more sharply divided, and the majority—however small—will be led to rule with a heavier hand, wielding a tyranny and intolerant of opposition. The House of Commons might cease to be a deliberative assembly in which legislation has due regard to the interests of minorities.

4. On the whole, then, it appears to the writer that the present character of the House of Commons, and the theoretical basis of its constitution, would be disturbed to its detriment by the adoption of

a system of proportional representation. Single-member constituencies are probably better adapted on the whole to democracy than any scheme which has been hitherto proposed.

Swing of the pendulum.

The "swing of the electoral pendulum" was the subject of a paper read before the Society two years ago by Sir R. Biddulph Martin. I propose to examine the same problem, but dealing with the figures in larger masses. The figures which follow relate only to seats which were contested at *both* elections; seats which were not contested at either the 1906 or 1910 elections are altogether eliminated.

In Great Britain there were 526 seats answering this description. In 1906 these were represented by 125 Unionists, 351 Liberals, 49 Labour members, and 1 Nationalist. The result of the last General Election was to alter this representation to 239 Unionists, 249 Liberals, 37 Labour members, and 1 Nationalist. An approximate proportion of Liberals to Unionists of 3 to 1 was thus converted into a ratio of approximate equality. This huge turnover of members is not reflected, however, in the movement of the votes. The total of votes cast in these 526 seats for Unionist candidates in 1906 was 2,221,400, and in 1910 this was increased to 2,749,769. Thus an increase of Unionist membership of 91 per cent. was effected by an increase in votes of $23\frac{3}{4}$ per cent. The votes for Liberal candidates were increased from 2,426,342 to 2,519,158; a reduction of membership by 29 per cent. corresponding to an increase of voters by less than 4 per cent. The Labour party showed a reduction both in members returned and in votes recorded. The votes given to Labour candidates in 1906 amounted to 437,171, and in 1910 to 410,972, a reduction of 6 per cent. in votes being accompanied by 24 per cent. reduction of members.

TABLE 7.—*Votes polled and electorates in seats which were contested in both the 1906 and 1910 general elections.*
[The black figures in brackets give the number of members returned.]

Division.	COUNTIES.									
	Electorate.		Unionist.		Liberal.		Labour, &c.		Total.	
	1906.	1910.	1906.		1910.		1906.		1910.	
			1906.	1910.	1906.	1910.	1906.	1910.	1906.	1910.
<i>a. England—</i>										
1. Northern	200,105	214,767	53,783 (0)	69,578 (4)	80,564 (12)	83,369 (9)	29,104 (3)	29,126 (2)	163,451 (15)	182,073 (15)
2. Yorks, Lanes and Cheshire ..	703,648	760,079	254,080 (12)	309,095 (17)	279,292 (32)	295,443 (27)	65,276 (6)	71,710 (6)	598,648 (50)	670,248 (50)
3. Midlands	520,277	557,818	210,605 (12)	251,683 (22)	218,043 (25)	201,895 (13)	19,811 (3)	41,226 (5)	448,459 (40)	491,804 (40)
4. Eastern	230,457	240,742	86,903 (2)	105,775 (12)	105,616 (20)	105,099 (10)	—	—	192,519 (22)	210,874 (22)
5. Home counties	856,915	957,946	340,048 (25)	481,799 (50)	350,347 (30)	349,149 (6)	9,532 (4)	—	699,927 (56)	830,948 (56)
6. Metropolitan	—	—	—	—	—	—	—	—	—	—
7. Western	379,014	402,150	145,923 (6)	177,738 (16)	180,237 (29)	182,032 (19)	109 (0)	238 (0)	326,209 (35)	360,008 (35)
Total	2,890,416	3,133,502	1,091,342 (57)	1,395,668 (121)	1,214,099 (148)	1,216,987 (84)	133,832 (13)	142,300 (13)	2,429,273 (218)	2,754,955 (218)
<i>b. Wales</i>	108,244	115,419	27,854 (0)	31,783 (1)	42,224 (7)	39,747 (6)	15,355 (2)	20,924 (2)	85,433 (9)	92,454 (9)
<i>c. Scotland</i>	421,145	450,950	131,735 (4)	151,728 (5)	189,369 (35)	207,169 (34)	15,603 (0)	17,824 (0)	336,707 (39)	376,721 (39)

TABLE 7. *Contd.—Votes polled and electorates in seats which were contested in both the 1906 and 1910 general elections.*

Division.	BOROUGH (OR BURGH).									
	Electorate.		Unionist.		Liberal.		Labour, &c.		Total.	
	1906.	1910.	1906.	1910.	1906.	1910.	1906.	1910.	1906.	1910.
<i>a. England—</i>										
1. Northern	144,327	148,463	44,242 (2)	55,366 (3)	35,207 (5)	53,099 (7)	38,116 (4)	19,047 (1)	117,565 (11)	127,512 (11)
2. Yorks, Lanes and Cheshire ..	713,090	743,042	253,293 (13)	287,014 (18)	239,493 (36)	266,600 (33)	114,375 (15)	107,193 (13)	607,161 (64)	660,807 (64)
3. Midlands	368,246	378,974	146,762 (10)	176,421 (20)	112,371 (18)	129,297 (14)	50,539 (6)	28,958 (3)	309,672 (34)	334,676 (34)
4. Eastern	88,229	94,256	36,281 (2)	41,156 (3)	34,016 (8)	38,384 (7)	7,778 (1)	5,560 (1)	78,075 (11)	85,100 (11)
5. Home counties	174,054	186,303	68,641 (9)	92,252 (18)	64,733 (11)	65,592 (3)	12,724 (1)	7,895 (0)	146,098 (21)	165,739 (24)
6. Metropolitan	683,733	722,417	253,380 (20)	321,169 (34)	212,127 (37)	251,361 (26)	36,629 (5)	30,747 (2)	532,136 (62)	603,277 (62)
7. Western	139,947	144,261	51,480 (2)	62,353 (11)	67,872 (15)	65,344 (6)	1,678 (0)	2,255 (0)	121,030 (17)	129,952 (17)
Total	2,311,626	2,417,716	854,079 (58)	1,035,731 (107)	795,819 (130)	869,677 (93)	261,839 (32)	201,655 (20)	1,911,737 (220)	2,107,063 (220)
<i>b. Wales</i>	90,328	97,218	24,763 (0)	33,417 (4)	45,515 (9)	44,032 (8)	5,094 (1)	10,191 (1)	75,372 (10)	87,640 (10)
<i>c. Scotland</i>	299,936	303,087	91,627 (6)	101,442 (4)	139,316 (22)	141,546 (24)	15,448 (2)	18,078 (2)	246,391 (30)	261,066 (30)

TABLE 7. *Contd.—Votes polled and electorates in seats which were contested in both the 1906 and 1910 general elections.*

Division.	COUNTIES AND BOROUGH (OR BURGH).									
	Electorate.		Unionist.		Liberal.		Labour, &c.		Total.	
	1906.	1910.	1906.	1910.	1906.	1910.	1906.	1910.	1906.	1910.
<i>a. England—</i>										
1. Northern	344,432	363,230	98,025 (2)	124,944 (7)	115,771 (47)	136,468 (16)	67,220 (7)	48,173 (3)	281,016 (26)	309,585 (26)
2. Yorks, Lanes and Cheshire ...	1,416,738	1,503,121	507,373 (25)	596,109 (35)	518,785 (68)	562,043 (60)	179,651 (21)	178,903 (19)	1,205,809 (114)	1,337,055 (114)
3. Midlands	888,523	936,792	357,367 (22)	428,104 (42)	330,414 (43)	331,192 (24)	70,350 (9)	70,184 (8)	758,131 (74)	829,480 (74)
4. Eastern	318,686	334,998	123,184 (4)	146,931 (15)	139,632 (28)	143,483 (17)	7,778 (1)	5,560 (1)	270,594 (33)	295,974 (33)
5. Home counties	1,030,969	1,144,249	408,689 (34)	574,051 (68)	415,080 (41)	414,741 (9)	22,256 (12)	7,895 (0)	846,025 (77)	996,687 (77)
6. Metropolitan	683,733	722,417	253,380 (20)	321,169 (34)	242,127 (37)	251,361 (26)	36,629 (5)	30,747 (2)	532,136 (62)	603,277 (62)
7. Western	518,961	546,411	197,403 (8)	240,091 (27)	248,109 (44)	247,376 (25)	1,787 (0)	2,493 (0)	447,299 (52)	489,960 (52)
Total	5,102,042	5,551,218	1,945,421 (115)	2,431,399 (228)	2,009,918 (278)	2,086,664 (177)	385,671 (45)	343,955 (33)	4,341,010 (438)	4,862,018 (438)
<i>b. Wales</i>	198,572	212,667	52,617 (0)	65,200 (2)	87,739 (16)	83,779 (14)	20,449 (3)	31,115 (3)	160,805 (19)	180,094 (19)
<i>c. Scotland</i>	721,081	754,037	223,362 (10)	253,170 (9)	328,685 (57)	348,715 (58)	31,051 (2)	35,902 (2)	583,098 (69)	637,787 (69)

Of course, this way of regarding the figures is somewhat misleading. It takes no account of the increased potential voting strength due to the increased electorate. In the constituencies referred to there was an increase in the electorate of 396,227, or 6·5 per cent. It appears to me that a truer test of the turnover of votes may be obtained by a comparison of the actual voting in 1910 with the voting which would have been recorded if each party had increased its strength in proportion to the increased electorate. If this had happened the result would be as follows:—

	Votes which would have been recorded if increase had taken place in proportion to electorates.		Votes actually recorded.		Increase (+) or decrease (—).	
	Unionist.	Non-Unionist.	Unionist.	Non-Unionist.	Unionist.	Non-Unionist.
England—						
Northern	103,400	193,000	124,900	184,600	+ 21,500	— 8,400
Yorks, Lanos } and Cheshire }	538,800	741,000	596,100	741,000	+ 57,800	....
Midland	376,800	422,600	428,100	401,400	+ 51,300	— 21,200
Eastern	129,500	155,000	146,900	149,000	+ 17,400	— 6,000
Western	453,600	485,800	574,100	422,600	+ 120,500	— 63,200
Home counties	268,000	294,500	321,200	282,100	+ 53,200	— 12,400
London	207,900	263,100	240,100	249,900	+ 32,200	— 13,200
Total	2,077,500	2,555,000	2,431,400	2,430,700	+ 353,900	— 124,300
Wales	56,400	115,900	65,200	114,900	+ 8,800	— 1,000
Scotland	233,600	376,200	253,200	384,600	+ 19,600	+ 8,400
Total Great Britain }	2,367,500	3,047,100	2,749,800	2,930,200	+ 382,300	— 116,900

For the purpose of this calculation there has been assumed only two parties, the Unionist and the non-Unionist. This simplification is justified by the fact that in many constituencies Liberals voted for Labour candidates, and supporters of the Labour party in other constituencies voted for Liberal candidates.

The figures are remarkable. The great political upheaval whereby a party of 125 Unionist members was increased to 239 was effected by a loss of Liberal and Labour votes of only 117,000, and an increase of Unionist votes of 382,000. This is, of course, on the assumption that the proper standard of comparison is that each party should have increased its voting strength in proportion to the electorate. It is clearly impossible to say what the net turnover of votes actually amounted to, for the figures given include those Unionists who abstained from recording any vote in

1906, but refrained from voting for an opposing candidate. This is probably the explanation of a large part of the increased percentage of poll. In 1906 the polling in the 526 seats which were also contested in 1910 was 83·1 per cent. of the electorate, compared with 87·1 per cent. in the latter year. On an electorate of 6,100,000 an increase of 4·0 per cent. of polling would represent about 240,000 votes. An explanation of the movement of votes, which is quite consistent with the figures, is, therefore, somewhat as follows : In 1906 about 200,000 Unionist voters deliberately abstained from recording a vote. In 1910 these Unionist voters resumed their allegiance to their former party. In addition it is probable that about 100,000 voters who supported Liberal and Labour candidates in 1906 voted for Unionists in 1910.

Conclusions.

The following is a brief summary of the conclusions reached in the present Paper :—

a. The register.

1. Out of 11,900,000 adult males, about 7,250,000 are electors able to poll 7,700,000 votes.

2. The total number of plural voters (*i.e.*, outvoters) is estimated at about 450,000.

3. The balance of 4,665,000 adult males not legally qualified to vote is accounted for, to the extent of about one half, to the present electoral disqualifications (*e.g.*, paupers, aliens, removals, &c.).

4. About 2,000,000 persons could be added to the register without any extension of the existing electoral laws (principally by the inclusion of lodgers, young men, and indifferentists of all ages).

b. The election.

5. The House of Commons consisting of 670 members, a distribution of members in proportion to electors would give England 44 additional members, and Ireland 41 less; on the basis of adult males, these figures would be 34 more for England and 34 fewer for Ireland; while, on the basis of actual population, England would have 38 members more and Ireland 37 less.

6. Similar errors of distribution exist in the various parts of England. Thus, in proportion to the electors, the home counties should return 22 more members, and the counties of Yorks, Lancs and Cheshire 19 more.

7. There is a slight negative correlation between the density of an electorate and the size of poll; *i.e.*, as densities increase, polls tend to diminish.

8. There is a tendency for the poll to diminish as the size of a constituency increases; *i.e.*, large constituencies and small polls go together.

9. The most powerful influence in producing large polls is the anticipation of a close contest; *i.e.*, small majorities and large polls go together.

c. The Parties.

10. There is a marked progression in party feeling from the North of Scotland to the South of England. In the North the Non-Unionist majorities are relatively largest. Proceeding Southwards, the Non-Unionist majorities diminish, and those of their opponents increase. In the Midlands the average majorities of Unionists and Non-Unionists are nearly equal. In the Southern Counties the Unionist majorities are very large, while those of the Non-Unionists are small.

11. There is a very slight indication that in large constituencies there is a tendency for the Unionist party to be weaker than in small constituencies; the coefficient of correlation is however small and the probable error large.

12. Allowing for uncontested seats the majority of votes polled by Non-Unionist candidates over Unionists (in other than University seats) was 451,000.

13. On a basis of redistribution and proportional representation, the Unionist strength in the present Parliament would have been increased by about 40 members, counting 80 on a division. In the North of England the Unionist party would have 32 more members, and the Non-Unionist parties 8 less than at present. On the other hand, in the Home Counties, Unionists would lose 11 members and the Non-Unionist parties would gain 33 members.

14. The present system of single-member constituencies of varying size affects the Unionist party most strongly in the large constituencies, especially those of more than 15,000 electors.

15. Proportional representation would probably overcome nearly all the evils of numerical misrepresentation of the various parties. The writer believes it would alter for the worse the character of the resulting House of Commons so that the parties would be more sharply divided in policy, and a small majority would be more tyrannous towards minorities than at present.

d. Swing of the pendulum.

16. The votes polled by Unionist candidates in the same seats as in 1906 were 382,000 more than is accounted for by an increase in proportion to the increased electorate; while the Non-Unionist vote on the same basis is 117,000 less.

17. It is suggested that the results of the last election may be due to a return of about 240,000 Unionist voters, who deliberately abstained from voting in 1906, and a net turn-over of about 100,000 Non-Unionist votes.

Finally, I desire to express my appreciation of the great value of the help I have received from Mr. M. I. Trachtenberg, B.A., and Mr. A. S. Reade, for their help in preparing the tables and in checking the correlation coefficients. The labour involved was so considerable that but for that help I fear it might have been impossible to complete the Paper in time for this meeting.³

APPENDIX.⁴

I have investigated still further the correlations dealt with in the foregoing paper. I wished to discover whether there was any geographical variation in these coefficients, and also whether the urban centres showed the same tendencies as in the rural areas. For this purpose, the country was divided into three broad belts. The first, containing 133 seats, comprised all the contested single-member seats in the North of England. The second, containing 148 seats, comprised the Midlands and the Eastern and Western Counties. The third, consisting of 131 seats, extends over the Home Counties and the Metropolis. In each area the borough and county seats are given separately and jointly. The following table gives therefore 36 correlation coefficients:—

³ The figures used in this Paper are based on the results as published in *The Times* during the progress of the election, and on the official returns for the 1906 election.

⁴ Added since the reading of the Paper.

TABLE 8.—*Correlation coefficients for contested single-member seats of England.*

Areas.	Electorate and percentage poll.			Electorate and percentage poll which was Unionist.			Percentage poll and percentage majority of poll.		
	Counties.	Boroughs.	Counties and boroughs.	Counties.	Boroughs.	Counties and boroughs.	Counties.	Boroughs.	Counties and boroughs.
Northern and York- shire, Lancashire and Cheshire	$-.50 \pm .06$ (73 seats)	$-.04 \pm .09$ (60 seats)	$-.23 \pm .055$ (133 seats)	$-.33 \pm .07$ (73 seats)	$-.29 \pm .08$ (60 seats)	$-.31 \pm .05$ (133 seats)	$-.44 \pm .06$ (73 seats)	$-.505 \pm .06$ (60 seats)	$-.46 \pm .05$ (133 seats)
Midland, Eastern and Western	$-.40 \pm .06$ (102 seats)	$-.44 \pm .08$ (46 seats)	$-.42 \pm .045$ (148 seats)	$-.26 \pm .06$ (102 seats)	$-.11 \pm .10$ (46 seats)	$-.23 \pm .05$ (148 seats)	$-.55 \pm .05$ (102 seats)	$-.83 \pm .03$ (46 seats)	$-.68 \pm .03$ (148 seats)
Home Counties and London	$-.45 \pm .07$ (56 seats)	$-.14 \pm .08$ (75 seats)	$-.11 \pm .06$ (131 seats)	$-.33 \pm .08$ (56 seats)	$-.12 \pm .08$ (75 seats)	$-.03 \pm .06$ (131 seats)	$-.42 \pm .07$ (56 seats)	$-.46 \pm .06$ (75 seats)	$-.37 \pm .05$ (131 seats)
All England	$-.44 \pm .035$ (231 seats)	$-.16 \pm .05$ (181 seats)	$-.22 \pm .03$ (412 seats)	$-.13 \pm .04$ (231 seats)	$-.19 \pm .05$ (181 seats)	$-.164 \pm .03$ (412 seats)	$-.50 \pm .03$ (231 seats)	$-.56 \pm .03$ (181 seats)	$-.51 \pm .025$ (412 seats)

It will be observed first that in the county areas geographical variations are comparatively slight. The correlation coefficient connecting size of constituency and size of poll varies between 0.40 and 0.50; the correlation coefficient for the size of the constituency and the Unionist poll varies between 0.26 and 0.33; while the third coefficient correlating the poll with the majorities varies between 0.42 and 0.55. This result is striking, and would seem to suggest a uniformity of habits and conditions and temperament in the rural areas which, as the other figures show, do not obtain in the urban constituencies. Not only are the coefficients uniform in the county areas, but they are also comparatively high.

On the other hand, there are not observable, so far as these investigations go, the same characteristics in different parts of the country in constituencies varying only according to the electorate or the poll. In the northern belt the coefficient correlating size of constituency with the poll is small, practically nil; in the southern belt it is only 0.14, with a probable error of 0.08. In both these cases, however, the coefficients connecting the size of the poll to the size of the majority are large. It might be therefore, and indeed it might have been foreseen as a consequence of the political psychology of the masses, that the keenness of a contest as represented by the approximation to party equality is a factor more powerful than any other in determining the size of the poll. If this be a correct explanation, the figures show this feeling to have been more pronounced in the towns than in the counties. The chances of winning a county seat from the party holding it are probably regarded as more remote than in the case of a town seat. Further, party feeling doubtless is made to run much higher in those cases where the opportunities for cultivating it are more numerous. The very high figure of 0.83 in the boroughs of the middle belt is mainly due to the large majorities in the Birmingham area. In these seats the relation between Unionism and electorate is expressed by the smallest coefficient. That is, here less than elsewhere is it true that more often than not a large constituency means a Unionist minority. In these seats there is observable at the same time evidence of large electorates being definitely accompanied by small polls (coefficient = - 0.44), and the small polls accompanied by large majorities (coefficient = - 0.83). On the whole, therefore, it follows, as is well known in this case, that the large constituencies in this area returned their members by majorities which were large in proportion to the poll. Many other deductions may be made from this table of coefficients. These are, however, left for the reader to discover.

The late Sir Robert Giffen.

THE PRESIDENT said before proceeding with the business of the day he must say a few words in recognition of the great loss the Society had sustained in the death of one of its oldest and most distinguished Fellows, Sir Robert Giffen. His connection with the Society began more than forty years ago, and for twenty years he had been most constant in his attendance, and had contributed several papers of more than British reputation. He gained, greatly through his connection with the Board of Trade and with the Society, a reputation and authority among statisticians almost unequalled in the special branches of statistics which he made his own. He had contributed ten or twelve papers to the Society before 1899, when he read his last, which was on import and export statistics, the system of recording which he practically remodelled when at the Board of Trade. He also published, in his "Essays in Finance," views on important subjects, such as the currency, national expenditure, and national income, which are household words among all those who deal with those subjects. He had been not only their president, but also an honorary secretary, and for a good many years editor of the *Journal*. In early years he was a journalist, and spent a long time in that occupation, an experience which had been of the greatest possible service to the Society. He saw in one of the obituary notices the other day a statement which, though new to him, was not at all surprising to those who knew Sir Robert, namely, that he had started life as a poet. That was not an occupation which those who knew him in connection with statistics would have been inclined to attribute to him; but most of those who had read his works, and particularly some of his essays, would have noticed that there was an extremely useful and very pronounced phase of imagination in some of them. Idealism was often useful in statistics, and it enabled him to project his mind beyond the actual data, sometimes insufficient, and to elucidate the object in view and occasionally to make the most daring and, as they turned out, the most fruitful hypotheses on matters of which he had not positive evidence before him. In fact, he was a very good illustration of what the late Professor Tyndall used to extol as "the scientific use of the imagination." Most of the older Fellows would have known him in connection with his work for the Society, and the younger members in connection with the part he took in the work of the British Association. He was president of Section F, and contributed various important papers to that Association which have been republished in the *Journal* of this Society. He (the President) had just received a letter from Sir Alfred Bateman, who preceded Sir Robert in his post at the Board of Trade, and who had known him intimately ever since 1886, saying that he "felt a personal loss that could never be replaced, and that his services to the Royal Statistical Society and the science of statistics could hardly be estimated by those of the

present generation." Those who had read his works would cordially re-echo that sentiment. He had hoped Sir Alfred would have been present to second what he had the honour and the sad privilege of moving, a vote of condolence with Lady Giffen in her loss, an expression of their sympathy with her, and an assurance that that loss was shared personally by many of the Fellows and, from the point of view of statistical science, by the whole Society. He would move that vote, which he would ask an old acquaintance of Sir Robert Giffen, Sir Leslie Probyn, to second.

Sir LESLIE PROBYN said he had great pleasure in seconding the vote, and only wished that some more able person had been selected who could say what they all felt about their departed friend.

DISCUSSION *on* MR. ROSENBAUM'S PAPER.

THE PRESIDENT said the Paper was now open for discussion and, fortunately, they were favoured with the presence of several gentlemen very competent to discuss all the important questions raised. As a general rule, he did not himself intervene in the discussion; but on this occasion, as Mr. Rosenbaum's Paper had followed one of his own, he ought to make a few observations. In the first place, in his opening, the author quoted him in justification of the treatment before that Society of what was really a political question. He did not recede from the attitude he adopted in 1896, when he read that Paper. On that occasion the then President agreed with him that the Paper was entirely statistical and, from the partisan point of view, impartial. He did not see how the Society, if it were to continue to be practically useful in discussing matters which could be illuminated by statistics, could avoid dealing with such questions, even though they might have a bearing on the party politics of the day. The very essence of what they required from the reader of the Paper was that the matter should be handled from a statistical point of view; and, as long as that criterion was satisfied, and the Paper, in the opinion of the referees, was up to the standard which statistical impartiality demanded, they ought not to debar themselves from discussing any subject merely because it happened to be before the public in a partisan atmosphere outside. If they were to boycott such subjects, with the greatly increased interest shown by legislation within the last few years in matters of social reform, how sterile would have been the field in which their labours could have been usefully employed! For instance, the question of the Poor Law had been for some time a matter of considerable party controversy, and was likely to be still more so in the future. The question of old-age pensions had been before the Society on several occasions, and had been analysed statistically, so far as the data allowed, in a manner quite in keeping with the traditions of the Society. Again, current questions of revenue and taxation, to which he had adverted in his reference to the late Sir Robert Giffen, were most legitimate subjects for con-

sideration, provided they were reviewed from the point of view of statistical science. There were other subjects which were even more hotly pursued on the fire of partisan eloquence at present, which they had avoided through policy because they had thought it better not to treat them statistically while they were being argued outside mainly on other grounds; and when possibly the statistical handling of them might be used outside in a manner which statistical science would deprecate. As to the Paper, the author had traversed a much wider field than he had done, but there were one or two points where they more or less coincided: first, the very difficult question of constituencies returning two Members; and he admitted that Mr. Rosenbaum had gone into the matter more fully, and had treated the distribution of votes in a way more accurate than he had. As to the question of plural voters, he had left it almost on one side, because he was dealing with the voting by localities, not the proportion of voters to population. But even Mr. Rosenbaum's very detailed handling had left the question uncertain; and he was not prepared altogether to accept the deductions from the numbers on the register of electors as leaving a correct residue of *persons* voting. There were many elements in the returns which were exceedingly difficult to handle; and he did not think they could be made to yield accurate results. On the question of claims made, he would remark that a claim had a technical, as well as the general meaning, and there was a distinction which was very important in practice between the statutory claim, which must be made by a lodger, and the claim which might be made by either occupier or owner, and ought to be made unnecessary by the overseer's registration. Again, with regard to the number on the register who did not vote, the author thought it was due to apathy, but it must be remembered that in regard to these vast changes of residence, from 20 to 26 per cent. of the register, it was the effort of any political organisation which wished to bring its members up to the poll to trace these removals and to record successions. Every year efficiency in tracing them was greater, and more absentees were brought to the poll. The number of people who deliberately abstained from voting was uncertain; and he did not think they could accept any given figure. Another question in which the author had gone outside the former Paper was that of correlation. He had fortunately had good assistance in this process, and the general results appeared to be exceedingly useful and very illustrative of the points to which he had applied his method. He would now ask a great authority on proportional representation to open the discussion by moving the vote of thanks.

LORD COURTNEY OF PENWITH said he was reminded by the President's observations how much more often he used to attend those meetings than he had done of late. But, with all his experience of former years, he did not remember any Paper which more thoroughly dealt with the subject taken in hand than this; and he must express his opinion that it was undertaken in the true spirit of science and without any tinge of political partiality. Mr.

Rosenbaum had grappled with the subject like a political mechanic ; he was dealing with forces, he was numbering units of force and marshalling them, and he had shown how they had been drawn together in the recent election, what results had followed ; he had in fact analysed the whole procedure and the consequences of those elections as a true problem in political mechanics. As reference had been made to the paper on the subject read by Sir Athelstane Baines, he could not avoid recalling what he thought was the first paper on electoral statistics, in which an analysis of a general election was laid before the Society many years ago by his esteemed and lamented friend, Mr. Droop. It was an admirable example of that spirit of impartiality which had now been followed ; and he had great pleasure in proposing a vote of thanks to Mr. Rosenbaum for his Paper. The President had intimated that he was supposed to be a partisan of proportional representation and of course he had approached the subject of this Paper very much in the spirit of one who desired to see how the question of the rearrangement of electoral machinery was dealt with by the author and to what conclusions he came. Reading it in that spirit, the first five-sixths or more gave him extreme satisfaction ; and if it was a little damped by the last portion, perhaps he might be allowed to say with all deference that he did not think the last sixth was quite as valuable as the five-sixths which preceded it. He would even venture to suggest some reasons for that. The author had said that no one now disputed the accuracy of the conclusions that our present method failed to give a trustworthy reproduction of the political opinions of voters who came to the poll ; one did not get the elected members in the several sections of opinion in the House of Commons corresponding in anything like an accurate degree to the division of electors outside. If the first motive of the institution of representative machinery was to reproduce in the House of Commons a microcosm or mirror of the opinion of the electors who took the trouble to come to the poll, the present system failed to realise it. It even failed in the recent election, as had been shown ; so that the present system was exposed to this fatal condemnation, that it did not fulfil the preliminary object with which it was framed. It would require a good deal to overcome that conclusion once it was established. Failing in its primary object, some secondary advantage must be extremely important in order to make them tolerate the present system if they could see a method of amending it. It failed, however, in many other respects in fulfilling what was desired. They admitted that in the last general election the failure to give a true representation of opinions was not so great as it had been on other occasions, when they had had the most ludicrous travesty of the balance of judgment of the country exhibited in the balance of judgment in the House of Commons. They had indeed experienced something more than exaggeration and travesty. On one, if not on more than one occasion, the balance of judgment in the House of Commons was in contradiction to the balance of judgment in the country as shown by the votes given by the electors. Mr. Rosenbaum could not bring that out, because in the last election

it did not exist ; but he would not deny that the failure to secure true representation and a mirror in the council of the nation outside had gone the length of absolutely falsifying the balance of opinion represented in the chamber as compared with that outside. Again, Mr. Rosenbaum dealt with the extreme importance of interesting as many voters as possible in elections, and in securing the representation of as many voters as possible in the House of Commons. Out of $6\frac{1}{2}$ millions of voters, he said $3\frac{3}{4}$ millions were successful in returning the candidates for whom they voted, but the other $2\frac{3}{4}$ millions were unsuccessful. According to the system of proportional representation, which had been advocated in many different forms, they would probably get out of $6\frac{1}{2}$ millions who voted something like 6 millions actually successful in sending members to the House of Commons. So that in bringing into relation with the members the voters outside, the system of proportional representation would produce an enormously greater advantage than the present system. To take a concrete example, let them assume a group of seven members as representing Manchester. Under the present system these were elected by majorities in seven different sections of Manchester, and only the majorities in those sections would get their members in. They might be all of one party, or they might be divided ; but only the majority in those sections would be represented. If, on the other hand, they allowed the seven members to be elected by seven different sets of people (grouping themselves freely together) throughout all Manchester, so that they might vote one-seventh for A, one-seventh for B, and one-seventh for C, and so on, they would get the whole of the electorate voting for those who would be returned. As a matter of fact, however, any quota just exceeding an eighth would be able to return a member, and the seven members chosen for Manchester would be elected by seven-eighths of the voters, leaving less than one-eighth failing to secure representation. He would point out how that affected another question. Mr. Rosenbaum said that where it was almost certain the majority would be small there was an enormous stimulus to bringing up electors to vote. It was the expectation of victory, of having some result for one's labour, which made men exert themselves to bring up their fellows, and made their fellows willing to come up and vote. It was the feeling that one might get the prize one sought for. But, if one had the system in existence which he had adumbrated, there would be a much larger number of persons certain to get the prize they were seeking, and therefore a much larger number of voters would be brought up to the poll. They would not be, as at present, brought up to secure half *plus* one, but to secure one-eighth or another eighth, or a third eighth, or whatever the fraction might be ; and so they would be stimulated to bring up as many as they could, and to secure as many different opinions as possible. The pressure would be keen, and the result would be the securing of another of the aims which representative institutions sought to secure, of making as many citizens as possible interested in the result. It was said recently by an elector in Johannesburg, where they conducted a municipal election according

to the proportional system: "This election has been to me a complete education. I have had the matter explained, I have had to choose between the candidates, I have had to study their opinions and to consider their relative merits and demerits, and I marked my paper. I have gone through a complete education, and I have got in my man. I am a full citizen in full exercise of all my rights." Here was another great result secured which the author of the paper desired. If, therefore, they wanted to secure in a governing assembly something like a trustworthy representation of enfranchised citizens outside, proportional representation gave them the security which the present system could not give, and which no amendment of the present system in the form of mere redistribution could secure. One might redistribute with the most exact mathematical accuracy, but, so long as the aim one was working for in redistribution was merely the creation of single-member constituencies of equal number of electors or equal populations, there was no security whatever that the resulting body would correspond in the divisions or varieties of opinion with the electing citizens outside. If one wanted an accurate representation, proportional representation afforded it. If one wanted stability, and desired to prevent those enormous over-turns from one side to the other, proportional representation offered the plan. If one wanted to enlist as many citizens as possible in the result, proportional representation offered the plan. If one wanted, in a word, to stimulate voters and give them political education, he did not care in what direction, whether called Conservative or Radical, if one wanted to make them political thinkers with opinions and desires of their own, and with a living connection with the members they elected, proportional representation offered the plan. But Mr. Rosenbaum said there was more to be considered; he went on to ask what was the effect on the candidates and on the House of Commons, and thought the candidate underwent now a very valuable education in having to consult the opinions and prejudices, it might be, of different sections of his electors so as to bring together, if possible, enough to secure him victory at the poll. It was true the candidate did go through that kind of education; he himself had gone through it pretty often; and, speaking from experience, fortified by the observation of others, he might say that if the education one desired for one's candidate was an education in the school of sincerity, it was a pretty bad one. If one wanted to make one's elected members genuine political thinkers, contributing as representatives, corresponding to the political thinkers and citizens outside, their element to the national council, that was not the way to do it. One must find some other method to bring into the House of Commons persons who realised that idea. He must confess to thinking that it was a bad preparation for a good House of Commons to put candidates through that kind of drill, which confessedly was not likely to make them more sincere, more honest, or more trustworthy. It was suggested that if members were elected in any other fashion, there would be accentuation of party spirit and perpetuation of political differences, and inside the House the opinions of different parties would be more sharply defined. It

was an extraordinary thing that in the countries where majority elections most prevailed with single-member seats as, for example, in the United States of America, party divisions within the House of Assembly were most rigid and most unwilling to yield. Further, as we had more and more developed our single-member system each party division in our House of Commons had become more rigid and fixed; and, in fact, the caucus which worked in connection with the system tended to make it rigid. He ventured to suggest that so far from a House of Commons elected on the principle of proportional representation exhibiting intolerant sections, it would bring together a number of unprejudiced members, looking at things more from the point of view of the nation than from the point of view of a particular section or party; and they would find that this was really the fear of the party managers. That was the real dread which filled their minds; under the reformed system they would have the members less amenable to party discipline; and they would have votes more often given by what might be called a free association of members than by the returns made to the party Whip. While apologising for going into an argument with respect to what was, as the author said, the moral aspect of the question, outside the purely statistical examination of the facts, he personally thanked Mr. Rosenbaum for his Paper, which he would be glad to see published and circulated as widely as possible, because its facts were full of instruction. As for the particular deduction which was drawn, as he thought unfortunately, at the close, he was quite ready to see it tested by the judgment of those who would take the pains to study the Paper.

Sir RICHARD BIDDULPH MARTIN, in seconding the vote of thanks, said they were very grateful to the author for his Paper, and for having elicited such an admirable speech from Lord Courtney. He did not propose to follow him on proportional representation because he had a little scheme of his own (most of them had), which he thought would settle all the questions which were so difficult to the rest of the world. His scheme would have all elections on one day, do away with ninety-nine out of a hundred contests, secure to every man a vote, to be recorded where he wished it given, and probably reduce the number of the House of Commons. He thought if they could succeed in those delightful results, the person who brought them forward would be entitled to public gratitude. In discussing these subjects one was apt to forget the history of representation in England. Up to 1832, less than a hundred years ago, nobody thought of the numbers of voters; it was the places they represented, and it was not thought a disgrace that Manchester, Birmingham or Liverpool, with thousands of qualified electors, should have no vote, while some little old country place like Gatton or Old Sarum had one or two. Of course they had got rid of that; but in finding a solution to the proper representation of England it had to be considered how the different interests which were undoubtedly represented in old days could be carried on when these different interests were somewhat obscured

by their numbers. In the recollection of a good many present there were different distinctions in the constituencies; the counties elected knights, who were girt with swords on the hustings; the towns and boroughs returned burgesses who were not girt with swords. All real interests had to be considered, so that the representation of the real wishes of the people in the easiest possible manner may be eventually secured.

Sir CHARLES DILKE said that the Paper, valuable though it was, left room for a good deal of doubt, not from any fault of the author but from the nature of the subject. He (Sir Charles) had sometimes uttered, even in that room, the heresy that the electoral system was such as to be incapable of statistical treatment. While he admitted that his view was a heresy, he thought there was a sound foundation for his statement, and he offered his criticism of the Paper in all friendliness from that point of view. There were in it very large assumptions. Those assumptions, and the statistical difficulties, had importance with regard to the side of the question on which the Paper was most valuable, namely, Redistribution of Seats, with or without alteration in the mode of election to Parliament. For, although they did not take away from the argument with regard to the three kingdoms, they greatly affected it. The electoral law was not the same, though it was supposed to be so, in Scotland as in England; it was made the same by Act of Parliament, but the decisions of the Courts had made it different. A "lodger" was not the same thing in Scotland as in England. As between Ireland and England, and still more as between Ireland and Scotland, the intention of Parliament to create uniformity was not carried out. There was an actual statutory difference in the case of Ireland. One franchise was continued in the law by a mistake, he thought, of the draftsman, only discovered afterwards. This was trifling and obscure, but there was a statistical difference which affected the problem though it did not reverse the argument. Given the difficulty of obtaining the numbers of duplicate or plural voters of all kinds, they were known to be fewer in Ireland than in England. The Irish registers were different; they had not an ownership list, and Division I and Division II in Ireland meant quite different things from what they did in England. With that general observation, he came to some details which he only brought forward because they affected the figures and assumptions of the Paper. On the second slip the author went into what he called "duplicates, plural voters, electors entitled to vote in more than one constituency." The word "entitled" begged the question. There were on the lists a number of people, duplicate voters, sometimes without knowing it, who were not entitled to vote in both or even in one of the two constituencies; they got on the register by mistake—and were often not known to be the same people. There were a great number of that class in English counties, and they affected the proportion of those who polled, because a great many were what might be called non-existent persons, and were improperly on the register. He would not describe the manner in which they got

on, but everybody acquainted with the system knew it was not altogether preventable, nor often due to fraud. It was further stated in the Paper that the question of the number of plural voters was not exhausted, and that it was a fruitful subject for further enquiry. That was perfectly true, but there was absolutely no hope of arriving at anything like a certain result, so long as they had the extraordinary variety of franchises superposed and differently interpreted in different parts in practice. In those circumstances any inquiry was of necessity guess work, and guess work in which the statistician had to proceed on the most arbitrary assumptions. His deductions might be right on the whole, and he might make wise and penetrating assumptions. But these could be absolutely upset if put forward in debate by prompt allusion to a particular case. As the author said, a large number of so-called ownership voters were only occupiers. Of course there were very different numbers and proportions in different constituencies, but he seemed to assume there that owners who were resident were otherwise entitled to be on the register. That was far from being the case always. He also assumed that almost the whole male population, or at all events all heads of families, or workmen earning a proper wage, under the present law, might be on the register. That was not so; it depended on characteristic habits in different parts of the country, as could be proved by looking at some figures of existing constituencies. The author said that the number of genuine out-voters was considerably fewer than the number given in the ownership column. There were many to be left out, and many to be put in, and he failed to see on what the author had based his guess in the Paper. He had assumed 450,000, but including non-resident voters of all kinds the number might be double that, and he thought it was nearer double. At all events, every examination went to show there were very few in Ireland, but there were more in England than anybody ever suspected; of Scotland he knew little. The difficulty of being sure was enormous. Certain political associations on the one side before the last general election, and on the other side since, had taken vast trouble and had gone through the lists in selected constituencies, to examine the different classes of what were called "out" and "plural" voters. It was difficult to use the facts statistically, because no definition of "plural voter," or "out-voter," or "duplicate voter" had been given so as to cover it in the same way. One could not be certain that what was called an out-voter in one place might not be quite different in another. "Out-voters" to the Londoner only meant freeholders. There were a great many occupying out-voters. They might be plural voters, but they had to be dealt with as out-voters by sub-agents, and very naturally the agents sometimes called them out-voters. Then it was assumed that there were in this country two million persons qualified to vote, but not on the register. That, he was convinced, was a mistake. Just as Mr. Rosenbaum had under-estimated the number of persons who possessed duplicate qualifications, so he thought he had over-estimated the number of persons qualified under the present law, but not on the register. He seemed to assume that voters put themselves on the register

But they did not; they were put on the register by the authorities. In many constituencies no one ever found a voter who put himself on the register. Take some of the greatest metropolitan boroughs; one would find there that no one, other than a lodger, had ever been known to take steps to put himself on the register, because the parochial authorities did that work so well that nobody ever dreamed of helping them except the lodger voter. In many rural constituencies there might be the apathy here described, although it was much less than formerly. The apathy was generally an apathy which was wise on the part of the intending voter, because the voter who remained permanently in one house as the occupier was put on by the authorities; but a man who moved and put his things into a lodging, even for a single day, in the course of removal between one occupation and another, was not entitled. If he did nothing, nothing was known about him, and he might get on the register. But if his case were actually taken up, the result was that he could not possibly get a vote, having broken his occupation. In some parts of the country three or four working class families lived in one large house, and in those cases there was the greatest possible difficulty in more than one of the heads of families getting on the register. In London they all got on, because each part of a house was held to be a house; but in the country it was not, and they could not get on under the present law. With regard to lodgers, the 5s. a week rent which the lodger had to pay in London admitted him very widely, but in the purely rural districts it was impossible to find lodgers really qualified. Even people in a superior class of life did not pay that rent; the rental of the whole house was not worth it in rural districts away from railways and main roads. He would only mention the actual figures of a few constituencies with different classes of voters to show those not acquainted with the subject its extraordinary statistical difficulties, revealing as they did the difference in the application of the law in different parts of the country, and the impossibility, confirmed by the comparison of any two county registers, of arriving at safe guesses on which to found one's proportion, other than the population and the persons actually voting. He would take two divisions, side by side, of the same county, and with the same population, and pretty nearly the same number of electors. In one of them there were 3,500 ownership voters, and in the other, 4,750 ownership voters. In the one case there were only 500 ownership voters who were out-voters in the proper sense of the word; and in the other case, nearly all of them were out-voters. In those two there were the same number of lodger voters, only a small number, but in one of those two, there were 1,000 service voters, and in the other 100, and the conditions of those two constituencies were pretty much the same. That pointed to a difference in the interpretation of the law or in local habit, and that was a fact which affected the whole electoral statistics, because it affected all assumptions of doubtful figures. The author seemed to assume that the lodger was a person who could put himself on the register if he chose to take the trouble. He disputed that assumption. Those entitled in a great number of

constituencies, where there was a considerable margin of persons not rigidly entitled to be on, got on if actively solicited to sign claims. But it was the law which made the difference, or the interpretation of it. On one page of the Return, in Essex, he found three divisions, large constituencies, which respectively contained 1,600, 1,900 and 1,300 lodgers to 39,000, 53,000 and 25,000 electors. One division of the county of Hereford, a small constituency, contained 1,000 lodgers in 9,000 odd voters. In Darwen, Clitheroe, Accrington and Rossendale divisions, there were 8, 20, 2 and 4 lodgers. That was not apathy; it was a different habit of life. In some towns in "rural" districts each working family had a house, in other places they lived in parts of houses which were not there held to be each of them houses, and which were not of a value entitling the head of each to be a lodger under the present law. Lancashire had constituencies side by side all the same size, in one of which there were over 2,000 lodgers, and in three others under 10. They were all of the same type, except in respect of the manner in which the people lived. Again with regard to the service vote, there was the most extraordinary distinction. In two divisions of the county of Durham, one of the northern counties, for which the service vote system was invented so as to enfranchise shepherds and carters in the North Western Division, there was only one service voter, and in the adjoining division, a division with a smaller number of electors, there were 116. He would only refer the author to the Scottish figures to show discrepancies even more extraordinary, which he could not himself explain. He knew the Scotch law was unintelligible, except to the Scotch; it was conveyed in a language they did not understand, and they knew that a lodger was not the same thing in Scotland as in England. He could not, therefore, offer any explanation why in some counties there were 4 or 12 or 14, or 18, and in places not conspicuously larger, nearly 4,000 lodgers in a single division. Why one county should have 3,000 or 4,000, and why another should have only 12 or 14 he could not explain. He mentioned those facts because they might, to some extent, justify his heresy that electoral facts were not really capable of statistical treatment; one had to make such guesses that although a skilled person taking a great deal of trouble might arrive at a result satisfactory to himself, and might think he knew something about the matter, even he would not arrive at it with such certainty that he would not be able to make out a case fit to put before other people. He repeated as he had began, that this attempt was an admirable attempt to marshal such statistics as were available. It was most interesting, and to a very great extent, except for that one point about Ireland, which was only a diminution and not an upsetting of the argument, most valuable for Redistribution purposes.

Mr. JOHN HUMPHREYS (Secretary of the Proportional Representation Society) said he desired to direct attention to the paragraphs on p. 486, which dealt with the relations between the size of constituencies and the size of the poll. Twelve of the

smallest constituencies were contrasted with twelve of the largest, and the percentages of the electorate taking part in the poll compared. Among the twelve smallest there were two urban constituencies, St. George's-in-the-East and Whitechapel, and while the average percentage for the small constituencies was 92·5, these urban areas showed percentages of 86·2 and 84·4, which were considerably less than that in any of the other small constituencies, all of which were country towns. If St. George's-in-the-East were contrasted with Walthamstow, one of the largest constituencies, but also an urban district, it would be seen that the percentages were almost identical, that in Walthamstow being 85. It would therefore seem that it did not greatly matter whether the area was small or large; a much greater effect resulted from the character of the constituency than from its size. There was a much greater difference between St. George's-in-the-East and Grantham, both small constituencies, than between St. George's-in-the-East and Walthamstow, and this difference was due to the fact that while both in St. George's-in-the-East and in Walthamstow the people were constantly seeking new quarters, in Grantham and the small country constituencies the population was more fixed in character. Mr. Rosenbaum anticipated that one of the consequences of the adoption of large electoral areas would be that a smaller proportion of the electors than before would proceed to the polls. But a careful study of the figures showed that there was little foundation for such a conclusion.

Sir CHARLES DILKE said that point could be illustrated by getting the pollings from the polling districts, and it would confirm the view that it was entirely a question of migration.

Mr. HUMPHREYS said he would also like to make one or two remarks on the conclusions summarised on p. 500. The first conclusion recognised the great value a proportional system would have in securing more accurate representation, and he would add that, as a great many political writers of considerable authority based their interpretation of political England upon the representation in the House of Commons rather than upon the votes polled, a proportional system would correct the false conclusions at which they arrived. In a recent article in one of the weekly journals, entitled "The Two Englands," the writer alleged that there was a vital difference between the north and the south of England. When the figures of the polls were analysed it would be seen that, although there was a difference, there was no such divergence as to warrant the deduction that there was a vital difference between those two districts. In the second of his conclusions Mr. Rosenbaum spoke of the party programme as now being an elastic one, but he would rather submit that the present system tended to make the party programme a rigid one. He would only instance the treatment of tariff reform by the Unionist party, which had made this question a test of party loyalty. No Unionist who was not a tariff reformer was now acceptable. Let them contrast that with what was taking place under the proportional system. The list of candidates pre-

sented by the Conservative and Catholic party in Belgium contained both free traders and protectionists. The fiscal question was not so prominent as in England, but leaders of all parties had assured him that under the proportional system it would not be possible to exclude candidates from the respective lists on account of their fiscal views. An example from present politics might be given. A question which had been under discussion in Belgium recently was that of military service. Yet an active dissident from the policy of the Government on this question still found himself on the Government list of candidates for Brussels for the coming election. These facts showed that under the proportional system the programme was not less, but more, elastic than under the present system. Mr. Rosenbaum also dealt in the same paragraph with the power which the present system confers upon the minority, and said that the member representing any constituency was always mindful in giving his votes of the interests of the minority. A great many of their French friends had found that the minority made far too insistent use of its powers. The deputy was known as the prisoner of the minority, and certainly the power possessed by a minority, which could make or unmake the candidate at the time of election, could be used in a very unfair way. It was not desirable that the majority should be set aside in order to give effect to the demands of a small minority, which could turn the scale under the present system at an election. In his last conclusion, Mr. Rosenbaum said "the result may be that in the House of Commons itself the party policies will be more sharply divided, and the majority, however small, will be led to rule with a heavier hand, wielding a tyranny, and intolerant of opposition." One might contrast the prophesy with what had actually taken place where the proportional system was in use. Indeed, it is the present system which gives rise to the tyrannical use of power. He might refer to the election of aldermen on the London County Council. Here a small majority of two, but a majority elected under our present system, had made the fullest and most tyrannical use of its power. It had chosen all the aldermen. In the Belgian Parliament there was also a small majority, but a small majority arising from a proportional system. There were long discussions some two years ago as to the terms upon which the annexation of the Congo should be made by Belgium. Were the views of the minority entirely over-ruled? Far from it. The moderate Conservatives were sufficiently favourable towards the views put forward by the minority, with the result that, instead of the majority acting tyrannically, as was the case in the London County Council, very material concessions were made by the Belgian Government to the minority. The moderate element in the majority were free to exercise their moderating influence, for it was not possible for the party to insist upon the same rigid discipline.

Mr. LESLIE MOORE said that in his opinion proportional representation would make government in this country, if not impossible, extremely difficult. At the present moment there were four, if not

five, parties in the House of Commons, and last year the House took six months in putting through the Budget which had not yet been sanctioned. Under proportional representation there was every probability that those four or five parties might become fourteen or fifteen, and in time, perhaps, forty or fifty, with the result that, instead of taking six months to pass a Budget, it might take six years, and government would come practically to a standstill. To some extent that was exemplified by the extraordinary difficulties which occurred in France and in Germany in getting through Government measures.

MR. M. I. TRACHTENBERG said whatever criticisms might be made of the way in which Mr. Rosenbaum made up the difference between the number of males entitled to the vote and the number on the register, his suggestions had the redeeming feature that they did fill the gap, and filled it adequately. After counting paupers, foreigners, domestics, &c., he was left with two millions to deal with, and it was suggested that this balance was largely accounted for by the fact that many males did not take advantage of their power to vote, and did not go on the register for two or three years after they had attained 21. This was supported by the fact that, according to the Census of 1901, the number of males between 20 and 25 was 1,900,000, and he would suggest to Sir Charles Dilke that a large proportion of these consisted of lodgers, who were in a way only fictitious lodgers, in the sense that they were the sons of their fathers, and would not go on the register at the first opportunity. With regard to the correlation results, he was glad to hear the President say they were useful figures, because he looked on a paper like this as one of a series, and one could only judge those coefficients truly by looking at the results for various elections. With regard to the correlation between the size of the electorate and the proportion of the poll which was Unionist, the result was supported by Professor Edgeworth's conclusion in his paper of 1898, that the effective sizes of constituencies are indiscriminately distributed between the two parties. He admitted that, with the advance in effective organisation and the introduction of such an important factor as the motor car, one would expect in certain cases very different figures now from those for twenty years ago. It was very desirable, therefore, that this Paper should take its place, not by itself, but as one of a series. It was sometimes said that one could not experiment with the British Constitution, and the student of social phenomena had to take events as they came. Therefore, in so far as elections made it possible to examine those correlation coefficients, they were welcome, though they might be very reprehensible in other ways. With regard to the coefficient for which the two random choices had given, 21 in the one case and 32 in the other, he would not be satisfied till he had obtained the coefficient for a larger choice, or, perhaps, for all the constituencies concerned.

MR. ACWORTH said Sir Charles Dilke had attributed the differences in the number of lodger voters in various constituencies

largely to the difference of methods of house building and house occupying adopted in closely adjoining places, but he doubted if he put sufficient stress on the length of the Revising Barrister's foot. There was a great deal in that, and he could give instances if necessary. With regard to the number of owner-voters, he did not think sufficient allowance was made for the case of a man who owned a house in the suburbs and was also the occupier of business premises, or it might be the reverse. Really, it was not reasonable to call him an owner-voter in the one sense because he was also qualified in that particular constituency as an occupier.

Sir CHARLES DILKE said an owner might go abroad and he would still remain on the register. In his own constituency there were never fewer than 200 ownership voters in America. They came back from time to time; they kept their freeholds and they went over to work.

Mr. ACWORTH said the point ought to be noticed as supporting the author's smaller figure that there were a great many people both owners and occupiers who, as a matter of fact, would very likely prefer to vote on ownership franchise rather than as occupiers.

Sir CHARLES DILKE said they could not help it; they were starred on the other list.

Mr. ACWORTH said there again there were differences in different constituencies in the method in which the register was made up and marked. He thought it was not a very happy phrase of Mr. Rosenbaum's that the electoral college was constituted by selection, by stating who might not be members. Strictly speaking, very few people are disfranchised. Certainly peers were not disfranchised; and women were not disfranchised, because they had never been enfranchised. According to the historical fact, a pauper was disfranchised, and so was a person guilty of corrupt practices; but they are disfranchised by being made an exception from a category in which otherwise they would be allowed to vote.

Mr. ROSENBAUM, in reply, thanked the members for the kind reception awarded to his Paper, and for the discussion and generous criticism to which he had been subjected. He said he knew when he introduced the question of proportional representation, and especially when he ventured to give expression to some objections to that proposal, that he was stirring up a hornet's nest. He hoped, however, that as the time was late the President would allow him to make some written observations in reply to Lord Courtney and other critics, to appear in the *Journal*. He would admit at once that the objections raised in the Paper to proportional representation were not statistical, and did not primarily arise out of the statistics of the election. He was prepared to admit, in fact, that so far as the statistics were concerned he believed no case could be made against proportional representation. It was because he felt this so

strongly, and because he was anxious, for what it was worth, to urge his view that there was another, besides the purely statistical, side to this question, that the irrelevancy had been introduced. With regard to Sir Charles Dilke's criticisms, he admitted they were of importance if the object of the Paper had been to estimate the number of plural votes, *i.e.*, the number of votes which would disappear if no man had more than one vote. That, however, was not his object. He desired only to discover how many adult males had no vote. To arrive at this figure it was necessary to know how many individuals had votes. This could be arrived at by deducting the plural votes from the number of electors given in the Parliamentary Return. Mr. Pease, the late Chief Liberal Whip, had stated in the House of Commons that the number of plural votes was 500,000. According to his own observations, he believed the number was considerably less, but he put it in the Paper at 450,000. Sir Charles Dilke's criticisms showed that this figure might be 100,000 more or less than the number given. When deducted from the total number of electors, the effect either way was small. Instead, therefore, of the number of adult males not entitled to vote being 4,700,000, the corrections suggested by Sir Charles might reduce the number to 4,500,000 or increase it by a corresponding amount. He was inclined to agree with Sir Charles Dilke that he had inaccurately described the balance of 2,000,000 adult males as persons who might be brought on the register without altering the existing laws. He had omitted to take into account the large numbers of young men living at home having no "qualification."

Added after the reading of the Paper.

Lord Courtney appears to have overlooked the fact that the Paper contained some objections justified by the statistics to proportional representation. In order to carry out this system, larger constituencies than at present would be created. It must be remembered that the Paper proves conclusively that one effect of large constituencies is that a smaller number of voters poll, and therefore more voters cease to interest themselves in politics. This cannot be an altogether desirable feature of an electoral system. Another conclusion drawn from the statistics is that a close contest is most conducive to keen political interest in any constituency; small majorities mean large polls. Proportional representation would abolish contests of this character; a candidate would seek not a majority but a "quota." Would this not have the effect of killing interest in political affairs among a large mass of the electors? But, says Lord Courtney, the scheme he is advocating would enable practically every man to feel that he has the member he wants to represent him. This is not strictly the case. What he secures is that he draws up a list, and one or other of these is his representative. His interest in one man may be great, and he is prepared to vote for him. But it may happen that many others are equally interested in the same candidate, and there is therefore not the remotest doubt that he will easily secure the necessary quota of supporters. Can it

be asserted with any confidence that knowing the man of his particular choice will be returned, he will be just as keenly interested in going to the poll and vote for his second or third or seventh choice? Lord Courtney makes much of the fact that $2\frac{3}{4}$ millions of the persons who polled at the last election did not vote for the successful candidate. He asserts, therefore, that the views of these $2\frac{3}{4}$ million persons are not represented in Parliament, or at any rate, there is grave risk that their views may not be adequately represented. This view is, I believe, open to two objections. The first is that $3\frac{3}{4}$ millions of persons voting in all parts of the country is likely to be such an excellent sample of the $6\frac{1}{2}$ millions of voters that the members returned by the $3\frac{3}{4}$ millions are likely to represent the views of the entire $6\frac{1}{2}$ millions. It would do so more accurately even now if the anomalies of unequal constituencies were abolished and a redistribution scheme carried. The second objection is that members under our present system do in fact represent some of the views of the minorities in their constituencies, especially those views which are not made the test of party loyalty.

Mr. Humphreys appears to have misapprehended the purpose of the table dealing with the relation between the size of constituencies and the size of poll. The writer is aware that among small or large constituencies conditions might arise tending to small polls in one place and large polls in another. The method of correlation eliminates or tends to eliminate these accidental or local causes and to assert of a particular factor that its tendency is to produce a given result. All that can be said of the small constituencies where the poll was small that if certain factors producing this small poll were removed, the poll itself would have been larger; or if the constituency were magnified, all other elements remaining, the chances are that the poll would be reduced.

S.R.

The following Candidates were elected Fellows of the Society :—

Samuel Bennett.
A. C. Carson.
Augustus C. Dale.

Bernard Haslewood.
Francis Wrigley Hirst.
A. M. Laughton.







SIR ROBERT GIFFEN, K.C.B., F.R.S., LL.D.

OBITUARY.

Sir Robert Giffen, K.C.B., F.R.S., LL.D.

SIR ROBERT GIFFEN'S sudden death on April 12 has removed from our ranks one who was the most popular, if not the ablest, statistician of modern times. That he should have obtained and merited such a position is a marvellous instance of Scottish determination. Born in the small Lanarkshire town of Strathaven, and educated at the mixed village school, Giffen had certainly no early advantages. At the age of 13 he moved to Glasgow, where he entered a solicitor's office in a subordinate position, in which he remained for about seven years. During part of that time he managed to attend lectures at the University of Glasgow—which many years later, in 1884, very fittingly conferred upon him the LL.D. Journalism from the first had considerable attractions for Sir Robert Giffen, and at the age of 21 he was sub-editor of the *Stirling Journal*. Coming to London two years later, in 1862, he became connected with the *Globe*, then more or less the Government organ of Lord Palmerston's administration. A few years afterwards he became a contributor to the *Fortnightly Review*, under Mr. John Morley, his contributions at that time including criticisms of Poetry and Belles-Lettres, in which he took considerable interest all through his life. It was in 1868 that he became sub-editor of the *Economist*, under Mr. Walter Bagehot, its editor and managing proprietor. Giffen throughout his life never failed to acknowledge the important influence Mr. Bagehot, as editor, had exercised over him, not only in method, but in style. With the smart inconclusive newspaper article Bagehot had no toleration, and one of his earliest instructions to Giffen as to leader writing was: "Say at the beginning of your article what you are *going* to prove, say in the middle of your article that you *are* proving it, and say at the end "that you *have* proved it."

Sir Robert Giffen may sometimes have overstepped the line of moderation in his statistical judgments, but as a rule he was singularly painstaking and careful in weighing statistical data, and his power of imagination was of immense use in suggesting to him the key to many an economic problem. Besides his work at this time on the *Economist*, Giffen wrote a good deal for the *Spectator*, and a little later he became connected with the *Daily News* in its City branch, and thus obtained a knowledge of the Stock Exchange, which served him well afterwards in his official career.

An important piece of work at this period was a report made by Mr. Goschen, President of the Poor Law Board, to the Treasury on the progressive increase of local taxation and the proportion of

burden borne by different classes of real property. This report is dated March, 1871, and a footnote to it ran, "I have pleasure in "expressing my acknowledgments of the valuable assistance which "Mr. Robert Giffen has rendered me in the collection of historical "materials and in the compilation of the various tables contained in "the appendices." Internal examination of the report and statistical tables by any one familiar with Giffen's style is convincing that the above encomium is fully deserved, and no doubt the reputation gained thereby helped to induce the late Lord Farrer (then Mr. Farrer), Secretary to the Board of Trade, to recommend Sir Charles Addersley to appoint him in 1876 Chief of the Statistical Department and Controller of Corn Returns. Giffen was indeed a Liberal, but of decidedly individualistic views, and his journalistic training in writing articles to order made it very easy for him to fall in with the proper and necessary official tradition of loyal support to the Government of the day.

Sir Robert Giffen's connection with the Royal Statistical Society had begun while he was a journalist, namely, in 1867, when he was proposed for the Fellowship by Mr. Frederick Martin, the founder of the *Statesman's Year-Book*, and seconded by Mr. Frederick Purdy, the Statistician of the Poor Law Board. From 1871, when he first served on the Council, he was intimately connected with the work of the Society, having been an Honorary Secretary from 1874 to 1881, Editor of the *Journal* from 1876 to 1891, Vice-President in 1880-81, and finally President from 1882 to 1884.

It may be convenient to add here a list of Sir Robert Giffen's contributions which have appeared in the *Journal* of the Society, distinguishing by an asterisk those read at meetings of the Society:—

1. "Depreciation of Silver." 1876.
- *2. "Recent Accumulations of Capital in the United Kingdom." 1878.
- *3. "Fall of Prices of Commodities in Recent Years." 1879.
- *4. "Use of Import and Export Statistics." 1882.
- *5. "Utility of Common Statistics." Presidential Address, 1882.
- *6. "Progress of the Working Classes in the last Half Century." Presidential Address, 1883.
- *7. "Further Notes on the Progress of the Working Classes in the last Half Century." 1886.
8. "Recent Rate of Material Progress in England." Address as President of Section F, British Association. 1887.
- *9. "Recent Changes in Prices and Incomes Compared." 1888.
- *10. "Accumulations of Capital in the United Kingdom, 1875-85." 1890.
- *11. "The Excess of Imports." 1899.

12. Address to Section F, British Association. 1901.
- *13. "Financial Retrospect, 1861-1901." 1902.
14. "The Wealth of the Empire and how it Should be Used." 1903. Read before Section F, British Association.
- *"Some General Uses of Statistical Knowledge." In the Jubilee volume of the Society, 1885.

This is indeed a striking record of statistical work done outside his departmental duties by a highly placed official, although Sir Robert Giffen would have been the first to admit that important help was rendered to him by his colleagues in the office in bringing together and dealing with the materials for many of his Papers. In 1894 the Guy Gold Medal of the Society was awarded to Sir Robert Giffen. Moreover, Giffen's outside activities were not confined to the Statistical Society, inasmuch as his published works, *e.g.*, "Stock Exchange Securities," 1897, "Essays in Finance," 1879-84, "Growth of Capital," 1890, and "Economic Inquiries and Studies," 1904, embracing a wide range of study and thought, necessitated a vast amount of research in their execution.

Meanwhile, his duties at the Board of Trade were continually becoming more onerous. When Sir Louis Mallet, the head of the Commercial Department, was transferred to the India Office in 1876, the Commercial Department of the Board of Trade was abolished, and its duties, other than those connected with statistics and the publication of tariffs, were handed over to the Foreign Office, but a Board of Trade without a Commercial Department was soon found to be a Hamlet without the Prince of Denmark, and after a very few years, on January 1, 1882, Giffen was appointed Assistant Secretary of a revived Commercial Department, with which the old Statistical Department was incorporated.

The new Department was actively concerned in the bankruptcy legislation carried through Parliament by Mr. Chamberlain in 1882, and it is interesting to have on record the following minute, signed by him as President of the Board of Trade in 1883, respecting Giffen's services *re* bankruptcy law :—

"I desire especially to record my obligations to Mr. Giffen, who is to a great extent the real author of the measure, and to whose exhaustive memoranda on the subject I owe the best part of my own knowledge. The criticisms to which the Bill has been subjected have not in the slightest degree shaken his conclusions or raised any doubt in my mind of the soundness of the principles on which our proposals were grounded."

Generous testimony such as this from a distinguished statesman is the very salt of life to the loyal civil servant. Besides Sir Robert Giffen's departmental duties at the Board of Trade during his twenty-one years of service, he rendered important assistance to

many Royal Commissions and committees. As regards statistics, he was a witness before the Departmental Committee on Official Statistics of 1879 and a member of the Treasury Statistical Inquiry of 1882. He was, moreover, a member of the Royal Commission on the Depression of Agriculture in Great Britain, which sat from 1893 to 1897, and of the Royal Commission on the Port of London, 1900-02. He was intimately concerned in the silver question, and gave evidence before the House of Commons Committee on Depreciation of Silver in 1876 and before the Royal Commission on Gold and Silver in 1886. In 1878 he was a witness before the Royal Commission on the London Stock Exchange, and in 1895 he gave important evidence before the Royal Commission on the Financial Relations between Great Britain and Ireland.

As regards Sir Robert Giffen's statistical work at the Board of Trade, there is a tendency in some of the obituary notices on him to exaggerate his services as a pioneer and to ignore his predecessors. As a fact, Mr. G. R. Porter was the real founder of the Board of Trade Official Statistics; before his time the official volumes relating to revenue and commerce were mere undigested masses of statistical record, large spaces being taken up by absolute blanks, and no informing abstracts being available. Following on Porter's labours, Mr. Richard Valpy made further improvements, and indeed instituted the various statistical abstracts relating to the United Kingdom, the colonies, and foreign countries, which have since become indispensable in the study of political and economic questions. What Giffen did, with his wonderful journalistic *flair*, was to popularise the use of statistics, and at the same time, by his scientific handling, to improve the constructive methods of official tables. Further, his fertile imagination was of great assistance to him in suggesting the various ways of attacking statistical problems, such, for instance, as that of the national income, the uncertain data for which had scared many a conscientious statistician.

Besides the re-establishment of the Commercial Department, a new but very important department was founded at the Board of Trade under Sir Robert Giffen, viz., the Labour Department, which, beginning with an attempt to record the earnings of manual labour in 1886, has now become so important as to have been recently made a separate department from commerce and statistics. Great credit is due to Sir Robert Giffen for having successfully guided the infant department and kept its course fairly even between capitalistic and trade union shoals. The greater credit is due to him in that the new work was not altogether congenial. He remained individualistic all his life, and even the Conciliation Act of 1896, mild as are its methods and practically nil its compulsory powers over the individual, was not quite to his liking.

Meanwhile the large increase in the three departments had necessitated a more comprehensive title for their chief, and in 1893 Sir Robert Giffen was promoted to be Comptroller-General of Commerce, Labour, and Statistics. Giffen was now approaching the age of 60 years, at which civil servants have the right to a pension, and although his intellect was in full vigour, the extraordinary exertions of his early days must have told on his bodily health, and he was unable to do without frequent intervals of rest. To one whom the late Lord Farrer rightly described in an official minute as "a glutton for work," this was quite a sufficient reason for retirement, and on September 30, 1897, only a few weeks after his 60th birthday, he handed over his three departments to his successor, Sir Alfred Bateman, who had shared his labours during all his years of service.

Sir Robert Giffen was by no means idle in his retirement, for as we have seen, he rendered important service at the Port of London Royal Commission, and was in 1908 Chairman of a Departmental Committee on the Official Trade Statistics. He also contributed occasionally to the magazines, probably his last article being one in the *Quarterly Review* of July, 1909, criticising somewhat severely Mr. Lloyd George's Budget of 1909-10.

It should be noted that Sir Robert Giffen rendered important help in founding the International Statistical Institute in London in 1885, though he was never able to take a very active part in its sessions. This was the more regrettable, as Sir Robert was a most impressive speaker on his own subjects, though not pretending to eloquence. It was, however, in private conversation with one or two kindred spirits that Giffen was at his best. Born one of the people and brought up among radical, if not democratic surroundings, he became in middle and later life essentially an aristocrat in its original and proper sense, having perhaps a too high opinion of brain and intellect in all callings and something nearly approaching contempt for mediocrity and work of a poor class. But whatever his opinions on any subject, his courtesy and geniality, combined with his love of a paradox, and his unconventional views, made him excellent company.

Besides receiving the proper official recognition, first of C.B., and then of K.C.B. in 1895, Sir Robert Giffen had the distinction of the Fellowship of the Royal Society. He was also an honoured member of the Political Economy Club, and for many years took a leading part in its debates.

Sir Robert Giffen married first in 1864, Isabella, daughter of Mr. D. McEwen, of Glasgow, and secondly in 1896, Margaret Anne, daughter of Mr. George Wood, of Aberdeen, who survives him.

A.E.B.

MISCELLANEA.

On the Correlation of Death-Rates. By KARL PEARSON, F.R.S., assisted by ALICE LEE, D.Sc., and ETHEL M. ELBERTON, Galton Research Scholar.

(1.) The discovery of possible inter-relationships between diseases by an examination of their death-rates as affected by varying environment, occupation, or race, has not been without fascination for more than one investigator. Personally I have considered the problem more than once, but always failed to make progress owing to the existence of spurious correlations, which I did not see how to meet.

I can illustrate the problem as follows: Let d_1, d_2, \dots, d_n be the total deaths at ages a_1, a_2, \dots, a_n in a sub-population (locality or occupation) of which the numbers of individuals at these ages are m_1, m_2, \dots, m_n ; these deaths being due to any special disease. Let d'_1, d'_2, \dots, d'_n be similar quantities for a second disease, and let $D_1, D_2, \dots, D_n, M_1, M_2, \dots, M_n$ and D'_1, D'_2, \dots, D'_n be similar quantities for the general population, or for any standard population.

Further, let $\delta = S(d)$, $\delta' = S(d')$, $\Delta = S(D)$, $\Delta' = S(D')$, $p = S(m)$, $P = S(M)$.^{*} Then, $1000 \delta/p$ and $1000 \delta'/p$ are crude death-rates. If these be written down for a series of sub-populations, then it will be at once obvious that if numbers like δ and δ' had been taken purely at random, there would be a correlation between these crude death-rates owing to the presence of the common denominator p . It will be impossible to state how much of the crude death-rate is due to *spurious* correlation, when δ and δ' are not numbers taken purely at random. We can get over this difficulty by correlating δ, δ' and p , and using the partial correlation coefficient ${}_{p\rho\delta\delta'}$, i.e.,

$${}_{p\rho\delta\delta'} = \frac{r_{\delta\delta'} - r_{p\delta} \cdot r_{p\delta'}}{\sqrt{1 - r_{p\delta}^2} \sqrt{1 - r_{p\delta'}^2}} \quad (i)$$

This would give us the required result, provided δ and δ' were really reliable measures of the deaths from the two diseases in the two populations. But the incidence of the disease depends upon the age-distribution in the two populations, and it is usual to allow for this by a *corrected* death-rate. This is obtained by calculating the number that would die in the given sub-population if its age-

^{*} S denoting a summation for all ages.

distribution were identical with that of the general or a standard population; *i.e.*, if

$$\hat{\delta} = d_1 \times \frac{M_1}{m_1} + \delta_2 \times \frac{M_2}{m_2} + \dots + d_n \times \frac{M_n}{m_n},$$

we take for our corrected death-rate

$$\frac{1000\hat{\delta}}{P} = \frac{1000.S(d \times M/m)}{P} \quad (ii)$$

Now it will be obvious that these corrected death-rates suffer from the disadvantage that we have a whole series of common denominators, m_1, m_2, \dots, m_n ; so that, if we took the series d_1, d_2, \dots, d_n and d'_1, d'_2, \dots, d'_n to be any random numbers, we should find spurious correlation between $\hat{\delta}$ and $\hat{\delta}'$ or $S\left(d \times \frac{M}{m}\right)$ and $S\left(d' \times \frac{M}{m}\right)$, and, of course, between the death-rates $1000\hat{\delta}/P$ and $1000\hat{\delta}'/P$.

When the d 's and d' 's are not taken at random, we should not be able to say how much of the actual correlation is really spurious.

The only way that had occurred to me of escaping this difficulty was to take the partial correlation of δ, δ' for constant p and constant m_1, m_2, \dots, m_n . The actual arithmetic thus demanded would be very great if a fairly reasonable series of age-groupings was taken. To get a *single* factor representing age-distribution did not seem feasible. The use of *average* age of the population had been tried in my laboratory, but we were not very confident of its sufficiency. The averages of two populations might be identical but the age-distributions be very different.

(2.) It was only after reading Dr. Maynard's paper in the current number of *Biometrika*, and thinking over the difficulties to which he draws attention, that another way of tackling the problem occurred to me. We reduce all our sub-populations to a standard population, or population with a standard age-distribution. The assumption made in doing this is, practically, that the particular standard population used is immaterial. If $\hat{\delta}_a$ and $\hat{\delta}_b$ be the values of $\hat{\delta}$ for two sub-populations reduced to the standard age-distribution, then the values of $\hat{\delta}_a$ and $\hat{\delta}_b$ will change, but not their ratio, if we reduce them to any other standard. Taking this assumption as our fundamental hypothesis, let us reduce our sub-population to the standard, and we have then to compare $\hat{\delta}$ and Δ . But we might equally have reduced our standard population to the sub-population as our standard, and we should then have had to compare δ with $\hat{\Delta}$ where $\hat{\Delta} = S(D \times m/M)$.

Hence, if our assumption be correct, we have

$$\begin{aligned} \hat{\delta} : \Delta &:: \delta : \hat{\Delta}, \text{ or} \\ \hat{\delta} &= \delta \times \Delta / S\left(\frac{D}{M} \times m\right), \\ &= \delta \times K_c, \text{ say;} \end{aligned}$$

and

$$\hat{\delta}/P = \delta/p \times K_c \times p/P.$$

Hence, $K_c \times p/P$ is a factor by which we must multiply the crude death-rate in order to obtain the corrected death-rate; *i.e.*, the sub-population death-rate free of the individual age-distribution. Now, if $R_c = K_c \times p/P$, R_c is the Registrar-General's corrective factor, by which the crude death-rate must be multiplied to obtain the corrected death-rate.* Its validity depends upon the hypothesis mentioned above—that the reduced death-rates are substantially independent of the standard population to which we reduce them. If we accept this, we have

$$\hat{\delta}/P = \delta \times R_c/p \quad (\text{iii})$$

Now it is easy to show that the correlation of δ/p and δ'/p for p constant is precisely the same thing as the correlation of δ and δ' for p constant. Hence, if R_c is a really accurate corrective factor for age-distribution, then the correlation of δ and δ' —or, if preferred, of δ/p and δ'/p , the crude death-rates, instead of the total deaths, for p constant and R_c and R'_c constant: or the partial correlation coefficient of total deaths from the two diseases, or crude death-rates, if preferred, for the two diseases—for constant population and constant corrective factors, will enable us to ascertain whether there exists a real relation not due to spurious correlation between the two diseases.

We must determine δ , δ' , p , R_c and R'_c for the series of sub-populations, and find the partial correlation coefficient for the first two, on the assumption that the last three are constant. This needs the evaluation of ten coefficients of correlation. The labour is considerable, but it may be repaid by the light it throws on the inter-relationship of diseases.

How far may we look upon the Registrar-General's corrective factor R_c as an accurate measure of the age-distribution? It certainly gives (using (iii)) results close to the value of $\hat{\delta}/P$ as found from (ii) for English districts. Whether in a country like America, where age-distributions vary so widely from city to city, it would be equally efficient, it is impossible to say without actual trial. A useful piece of work would be to correlate $\hat{\delta}/P$ as found from (ii) and (iii), and so measure the efficiency of R_c . I think its value will be probably found, for English districts at least, within the probable errors of sampling.

(3.) Miss Ethel M. Elderton has kindly worked out for me the case of the 40 American cities dealt with by Dr. Maynard, confining her attention, however, to the cancer and diabetes death-rates. The following ten coefficients of correlation were obtained:—

* I have not seen any proof given of the validity of this corrective factor, and so devised the above one.

r_{12} , Cancer deaths and diabetes deaths	=	·9710			
r_{13} , " population	=	·9869			
r_{14} , " cancer corrective factor	=	·0476			
r_{15} , " diabetes corrective factor	=	·0255			
r_{23} , Diabetes deaths and population	=	·9472			
r_{24} , " cancer corrective factor	=	·0623			
r_{25} , " diabetes corrective factor	=	·0403			
r_{34} , Population and cancer corrective factor	=	·1348			
r_{35} , " diabetes corrective factor	=	·1161			
r_{45} , Cancer corrective factor and diabetes corrective factor....	=	·9890			
$\Delta =$	1	·9710	·9869	·0476	·0255
	·9710	1	·9472	·0623	·0403
	·9869	·9472	1	·1348	·1161
	·0476	·0623	·1348	1	·9890
	·0255	·0403	·1161	·9890	1

Hence: $\Delta_{11} = \cdot0020,6272$, $\Delta_{22} = \cdot0003,7592$, $\Delta_{12} = -\cdot0006,2567$.

From these the determinant Δ was put down, and minors Δ_{12} , Δ_{11} and Δ_{22} calculated. The value of the partial correlation coefficient for constant population and constant diabetes and cancer corrective factors, namely, ${}_{3,45}\rho_{1,2}$, was given by ${}_{2,3,4}\rho_{1,2} = -\Delta_{12}/\sqrt{(\Delta_{11}\Delta_{22})} = \cdot7105$. There is, therefore, but little doubt that in the cities dealt with by Dr. Maynard there is a real correlation of a high intensity between the death-rates from cancer and diabetes.

The values found by Dr. Maynard were $\cdot6896$ for the correlation between numbers of deaths from cancer and from diabetes for a constant population, *i.e.*, without age-correction, and $\cdot7325$ for the correlation of death-rates from the two diseases corrected for age by the Registrar-General's factor. The value found above, which strives to remove the possibility of spurious correlation arising from both total populations and age-distributions, lies between the two values found by Dr. Maynard.

(4.) The high value of the correlation between the corrective factors for cancer and diabetes ($\cdot989$) suggested that we might treat this corrective factor as the same in these cases, and find the correlation between total cancer and diabetes deaths for constant population and constant corrective factor, say for cancer corrective factor. This would, if it lead to sensibly the same result, save much arithmetic, as we should only need six, not ten coefficients. We have the following correlations:—

r_{12} , Career deaths and diabetes deaths	=	·9710
r_{13} , " population	=	·9869
r_{14} , " cancer corrective factor	=	·0476
r_{23} , Diabetes deaths and population	=	·9472
r_{24} , " cancer corrective factor	=	·0623
r_{34} , Population and cancer corrective factor	=	·1348

These give—

$$\Delta = \begin{vmatrix} 1 & \cdot9710 & \cdot9869 & \cdot0476 \\ \cdot9710 & 1 & \cdot9472 & \cdot0623 \\ \cdot9869 & \cdot9472 & 1 & \cdot1348 \\ \cdot0476 & \cdot0623 & \cdot1348 & 1 \end{vmatrix}$$

leading to $\Delta_{12} = -\cdot0299$, $\Delta_{11} = \cdot0966$, $\Delta_{22} = \cdot0182$,

and ${}_{3,4}\rho_{1,2} = -\frac{\Delta_{12}}{\sqrt{\Delta_{11}\Delta_{22}}} = \cdot7131$

in very good agreement with the previous result. Unfortunately, while this works very well for cancer and diabetes, it is unlikely that other pairs of diseases with widely different age incidence distributions, would give as good results, and we could not, *à priori*, suppose the correlation of their corrective factors to be nearly perfect. This simplification of the method is not likely to have any general application.

(5.) The next point which needs consideration is the possibility that the relationship between cancer and diabetes death-rates is produced by the simple principle that certain towns are more unhealthy than others, and hence deaths from *all* types of diseases will be greater in those towns. Dr. Maynard has, to some extent, met this objection in his paper by showing that the high correlation found between the diabetes and cancer death-rates does not hold between the nephritis and cancer death-rates.

I suggest the following method of testing this point. The cancer death-rate should be correlated with the death-rate from all diseases less cancer and diabetes. This must be done for constant population and constant age correction factors for cancer and for all other diseases other than cancer and diabetes.

Accordingly, Dr. Alice Lee took forty cities in the Registration States, United States, having more than 90,000 inhabitants, and calculated their age correction factors for (a) cancer deaths, and (b) all deaths other than cancer and diabetes. She then found the ten correlation coefficients of the following five quantities:—

- (1.) Deaths from cancer.
- (2.) Deaths from all diseases other than cancer and diabetes.*
- (3.) Population.
- (4.) Cancer age corrective factor.
- (5.) All diseases, except cancer and diabetes, age corrective factor.

The following values were found:—

r_{12} , Cancer deaths and "other diseases" deaths	=	·9915
r_{13} , " " population	=	·9945
r_{14} , " " cancer corrective factor	=	·0370†
r_{15} , " " "other diseases" corrective factor	=	- ·1269
r_{23} , "Other diseases" deaths and population	=	·9935
r_{24} , " " cancer corrective factor	=	·0646
r_{25} , " " "other diseases" corrective factor	=	- ·1161
r_{34} , Population and cancer corrective factor	=	·0908
r_{35} , " " "other diseases" corrective factor	=	- ·0961
r_{45} , Cancer corrective factor and "other diseases" corrective factor	=	·4615

These give the following determinant Δ :—

1	·9915	·9945	·0370	-	·1269
·9915	1	·9935	·0646	-	·1161
·9945	·9935	1	·0908	-	·0961
·0370	·0646	·0908	1		·4615
- ·1269	- ·1161	- ·0961	·4615	1	

* All diseases other than cancer and diabetes will be spoken of as "other diseases."

† The forty cities taken were not absolutely identical with Dr. Maynard's.

Hence we have $\Delta_{12} = -\cdot001,534$, $\Delta_{11} = \cdot009,259$, $\Delta_{22} = \cdot006,114$
and ${}_{3,4,5}\rho_{1,2} = +\cdot2039$.

Thus, as we might anticipate, there is some correlation between the death-rate from cancer and the death-rate from all diseases other than cancer and diabetes. It measures, so to speak, the association produced by general unhealthiness. But it is of a wholly different order to the correlation between the cancer and diabetes death-rates after this has been corrected for population and age-distributions as affecting these diseases.

(6.) I think, therefore, that the relation indicated by Dr. Maynard between cancer and diabetes is a real association. It has been here discussed statistically, but no doubt it will be found eventually to have a physiological or pathological basis.

I must frankly admit that at first I viewed Dr. Maynard's conclusion as in some way based on disregarded spurious correlation, and due to non-allowance for population, age or general unhealthiness factors. But I have been gradually forced by the pressure of these statistical results to consider it something very real.

The method applied appears to me to correct fully for varying population, for varying age-distributions, and for general unhealthiness. It will apply to many problems besides that of cancer and diabetes; in fact it will, I think, enable us to determine statistically unsuspected associations between disease types. But it is proper to emphasise that the arithmetical work is excessively laborious; the determination of the corrective factor, the work of finding ten correlation coefficients, and of evaluating the determinants must not be undertaken without this word of warning, because the enormous amounts of arithmetic carried out by Miss Ethel Elderton and Dr. Alice Lee are scarcely indicated in the mere statement of the results provided above. Still, this work has been done and can be repeated, and I do not see at present any other satisfactory method of approaching this remarkably important problem of the correlation of death-rates. Till further explanation is forthcoming, I think we must admit a far closer relation between cancer and diabetes than is to be found between cancer and the sum of other diseases.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Report of an Enquiry by the Board of Trade into working-class rents, housing and retail prices, together with the rates of wages in certain occupations in the principal industrial towns of Belgium*. 218 pp., fol. [Cd-5065.] 1910. Price 2s. 2d.

After the stupendous masses of facts and figures contained in the similar reports upon the United Kingdom, France and Germany, the Belgian volume is a comparatively light morsel, and may be assimilated without much trouble. No attempt has been made to depart from the general lines laid down for the previous enquiries by the late Mr. Wilson Fox. It is, of course, a matter for regret that the Belgian statistics are related to the month of June, 1908, instead of October, 1905, the date of the corresponding statistics for the three great neighbouring countries. Reasons are adduced in the report for the conclusion that the effect of any changes during the intervening period upon possible comparisons must be trifling; and no doubt this is so, as between one year and another. But there may be seasonal variations in certain values, especially in food prices, which would render comparisons between summer figures and autumn figures unsatisfactory. For this reason it would have been better to select October, 1908, as the standard date for Belgium.

A study of this volume certainly strengthens the opinion previously expressed in the *Journal*, that the method of indicating international comparisons adopted by the Board of Trade is not altogether satisfactory, and that the great quantities of invaluable statistical material obtained might be utilised in other ways with greater effect. When the figures for 15 Belgian towns, with a total population of 1,680,000, are brought into comparison with those for

94 towns in the United Kingdom, with a total population of 16,500,000, it is unlikely that any method of statistical means and ratios expressed in index numbers can be very convincing. Considerations of this nature deprive Part II of the general report of a good deal of the interest and value that would otherwise attach to it. The comparison of individual British towns with towns on the Continent whose conditions were similar in certain respects would be both more trustworthy and more interesting, inasmuch as a large part of the material which is not really comparable would be excluded from any carefully instituted comparison of this kind. As an illustration of what is possible in this direction the figures given below for Antwerp and Belfast, both wholly extracted

	Antwerp.	Belfast.
Population	310,903 (1907) (386,791 within the fortifications)	366,220 (1906)
Birth-rate, 1905	24.1	31.8
Death-rate, 1905	14.0	20.0
Predominant weekly rents—	June, 1908.	October, 1905.
Three-room dwellings	3s. 2d. to 4s. 5d.	2s. 6d. to 3s. 6d.
Four-room dwellings—		
“Kitchen” houses	3s. 8d. to 4s. 10d.	{ 3s. to 4s. 4s. 6d. to 5s.
“Parlour” houses		
Retail prices—		
Sugar, loaf	3d., 3½d.	2½d.
Eggs, per 1s.	12—13	8—10
Cheese	7d. to 9½d.	8d.
Butter	1s. 1d. „ 1s. 2d.	1s. 2d. to 1s. 3d.
Potatoes, per 7 lbs.	2½d. „ 3d.	3d.
Flour	9½d. to 1s. 0½d.	10d.
White bread, per 4 lbs.	4½d.	5½d.
Milk, per quart	2½d.	2½d.
Coal, per cwt.	1s. 1¾d. to 1s. 3¾d.	1s.
Paraffin oil, per gallon	6½d. „ 7d.	7d.
Beef, ribs, per lb.	7d.	{ 5d. to 7d., 8d. to 9d. home killed
Mutton, leg	9½d.	{ 5d. to 6d., 9d. to 10d. home killed
Pork, leg	8¾d. to 10½d.	{ 8½d. to 9d., home killed
Wages per week—		
Bricklayers, masons, carpenters, joiners, plumbers and plasterers }	23s. 5d.	38s. 3d.
Painters	23s. 5d.	36s.
Labourers (building trades)	18s. 2d.	16s. to 19s.
Fitters	21s. 7d.	37s.
Turners	24s.	38s.
Patternmakers	24s.	39s.
Labourers (engineering)	14s. 5d.	15s. to 18s.
Compositors (hard)	20s. 6d.,	{ 34s.
„ (machine)	28s. 10d.	
Hours of labour per week—		
Building trades	65	54

from these reports, have been brought together. Each town is the principal port of a country whose chief industry is agriculture; each has a population of between 300,000 and 400,000, and each has large manufacturing industries. As a port, Antwerp is far ahead of Belfast; but, on the other hand, Antwerp has no great industry to compare with the linen manufactures of Belfast.

In a few years' time all this material will have lost some of its value, owing to the ceaseless ebb and flow of industry and population. It is to be hoped that it will not be allowed to remain buried in these official reports until all its interest has evaporated. Any statistician who should devote himself to an analysis of these tremendous accumulations of facts concerning the vital conditions of industrial populations would be deserving of the utmost commendation, not only from his fellow statisticians, but from the reading section of the public.

It is impossible to deal with the Belgian volume without again remarking on the excellence and the comprehensive character of the special reports on each town. None of the investigators has confined himself to the indicated objects of the enquiry, but in each case the aim has been to discover the whole of the conditions of industrial life in each community, whether they all fit into a scheme of totals and comparisons or not. In other words, it is not only results which have been collected and studied, but also the causes, or some of them, which have probably gone to the production of those results. The Brussels report is careful to observe that "the average working-man's wife buys meat without reference to, or knowledge of, the part of the carcase from which it is cut." The Antwerp report pays particular attention to immigration, and gives details of all foreign elements of the population. The small-arms industry at Liège has been carefully investigated in such a way that it is impossible not to see the great importance of its effects upon the growth and industrial conditions of the town. Instances of this kind might be multiplied almost indefinitely to show that the student who gives the necessary time to this report need never be misled in consequence of the general character of the conclusions and comparisons which are attempted in the general report.

The rent-level is obviously the most difficult thing to gauge, in Belgium as elsewhere, on account of the varying systems of local taxation. The general report states that "the rents paid by working-class tenants in Belgium do not appear to include directly any element of local taxation," and the comparison with English rents is approached on that basis. But in the special report on Brussels we find a different version, as follows: "While the foregoing rents undoubtedly include a certain element of taxes (State and provincial, as well as local), it is not possible to form an estimate, however rough, of the proportion in which that element is present in their composition." Thus more than usual uncertainty appears to exist on this point as regards Belgian rents, the figures of which are based on individual inquiries made of about 32,000 tenants. Other points bearing on the rent-level are the sanitary conditions, which are reported as unsatisfactory, the houses being crowded

together in blind courts and alleys, of which only a very small proportion have a separate water-supply. The sizes of the rooms are considered to be somewhat in excess of the sizes of similar rooms in England; and in Ghent the municipal bye laws enact that every dwelling-house must have a *minimum* of three habitable rooms, each with an area of at least 150 ft. This apparently relates only to new buildings. Cheapness of transit is another factor affecting the rent-level, and Belgian workmen are particularly well served in this respect. We are told that, "owing to the cheapness of travel, both by workmen's trains and on the system of light railways which has been so extensively developed in Belgium, many workmen live at a considerable distance from their place of employment." Some of them live as far as 18 miles out of Brussels.

The statistics of wages and hours of labour are especially full for Belgium, but it would be necessary to quote more tables than we have space for in order to give an adequate account of them. They are, of course, less difficult to deal with for purposes of comparison. The retail prices have been obtained in the same way as for other Continental countries, viz., by quotations from numbers of shopkeepers in each town. No less than 1,859 budgets of family expenditure have been obtained and analysed, the classification being based on the family income. In "weighting" the index numbers representing the effect of food prices, the following average weekly quantities were used:—

Coffee	1 lb.	Butter	2½ lbs.	Beef	2¾ lbs.
Sugar	1 „	Potatoes.	33 „	Mutton	¼ lb.
Bacon	¾ „	Flour	¾ lb.	Veal	¼ „
Eggs	7	Bread	34½ lbs.	Pork	1 „
Cheese.....	½ lb.	Milk	4 quarts	Coal	1½ cwt.

The corresponding data for the United Kingdom are on p. 210 of the *Journal* for March, 1908; for Germany, on p. 529 of September, 1908; and for France, on p. 116 of March, 1909. But in making comparisons it must not be forgotten that the Belgian prices relate to June, 1908, while all the others relate to October, 1905.

The following table gives as much as is possible of the summary of comparative conclusions for the Belgian towns dealt with in the report:—

Geographical groups.	Number of towns in group.	Mean index-numbers.				
		Rents.	Prices.	Rents and prices combined.	Wages of skilled men in building, engineering, and printing trades.	Approximate relative level of "real wages."
Brussels	1	100	100	100	100	100
Antwerp	1	99	95	96	89	93
Other Flemish towns	7	59	93	87	78	90
Walloon towns	6	67	97	92	91	99

For the comparisons between Belgium and the United Kingdom reference should be made to the general report, as it is impossible to reproduce them without a large number of explanations and reservations. But in arriving at one of the bases of comparison some strain is placed upon the method adopted of comparing mean predominant rents. In order to obtain figures suitable for comparison with the rents of English working-class tenements, three classes of Belgian tenements are selected—those of 2 rooms, 3 rooms and 4 rooms. But when we come to details in the case of Brussels (which includes two-fifths of the population dealt with), it appears that in Brussels city 48·5 per cent. of the working-class dwellings are single-room tenements, and 41·5 per cent. are two-room tenements, leaving only 10 per cent. altogether for two of the classes used in the comparison with England and Wales. In Greater Brussels the available figures cover only eight out of the nine communes, but they show 34 per cent. of single-room tenements, 45·4 per cent. of two-room tenements, and only 20·6 per cent. of tenements with three or more rooms. These figures make it still more difficult to accept the conclusions drawn in the report as to rent comparisons. Scientific perfection, however, is hardly possible in handling such numerous and varied series of figures, and it is a matter for congratulation that the high standard set by the earlier reports is being well maintained. E.J.H.

2.—*Occupation mortalities, with an abstract of discussion thereon.* (*Transactions of Faculty of Actuaries*, No. 45.) 86 pp., 8vo. London: C. and E. Layton, 1909. Price 2s.

There are few branches of mortality statistics that are so replete with real interest, and at the same time present such practical difficulties, as that which attempts to deal with the influence of occupation on mortality. The Paper on occupation mortalities submitted in November last to the Faculty of Actuaries in Scotland by Dr. James Crawford Dunlop, Medical Superintendent of Statistics in the Office of the Registrar-General for Scotland, and since published in the *Transactions of the Faculty*, is a most useful and valuable contribution to this subject. The Paper not only contains a full and careful historical analysis of the various attempts that have been made during the last fifty years by official statisticians in England, Scotland, France, and Switzerland to ascertain and differentiate the varying rates of mortality of those engaged in different occupations; it also describes the various methods that have, from time to time, been adopted with a view to overcome the inherent difficulties of the problem, and discusses their merits.

Dr. Farr, more than fifty years ago, in his report on the census in 1851, pointed out that the mortality of males engaged in different professions and occupations appeared to “open a new field of inquiry,” rendered possible by the record of facts in the census schedules and in the death register. He at the same time called attention to the “peculiar difficulties that beset all inquiries into the mortality of limited, fluctuating, and sometimes ill-defined sections of the population.” Dr. Ogle and Dr. Tatham, the successors

of Dr. Farr at the General Register Office, have extended and done much to improve English occupational statistics, but the nature of the available materials, and the consequent inherent difficulties of the subject, appear still to stand in the way of the full acceptance of these available statistics as affording a trustworthy measure of the influence of mere occupation on mortality. Careful consideration of the observations of successive Medical Superintendents of Statistics to the Registrar-General for England, of Dr. Dunlop's helpful Paper, and of the expert discussion thereon which followed the reading of the Paper, raises serious doubts whether, in present circumstances, statistics based upon census returns of occupation, as now recorded in the occupier's schedule, and upon the facts now recorded in the death register, can be fully trusted to give a true indication of the influence of different occupations on the health or rate of mortality of those engaged therein. The census schedule has hitherto only recorded the occupation or profession in which persons are actually engaged at the time of the census; and in the death register is generally recorded the last occupation or profession in which the deceased person was engaged, without reference to any occupation that may have been previously followed. In addition to these drawbacks, more than one occupation is frequently returned in the schedules, which increases the difficulty caused by changes of occupation. The most recent occupational statistics relating to England and Wales, published in Part 2 of the Supplement to the 65th Annual Report of the Registrar-General, showed that the death-rates of males aged 25—65 years during the three years 1900-01-02, after due allowance for varying age constitution, gave a comparative mortality figure of but 524 for clergymen, priests and ministers, the corresponding figure for all males in England and Wales being taken as 1,000. Among males of the same ages following other occupations, in the same years, the comparative mortality figure ranged upwards to 1,883 for inn and hotel servants, 2,007 for costermongers, hawkers, &c., and 2,235 for general labourers. Inn and hotel service, including barmen and others serving in inns and hotels, have invariably shown high death-rates at all ages, according to English, Scotch, French, and Swiss statistics, which excess may therefore probably be correctly attributed, in great measure, to the occupation and its associated risks and temptations. Equally in accord are nearly all published statistics showing the low rate of mortality at all ages prevailing among the clergy, priests, and ministers. The comparative mortality figure for barristers and solicitors during the same three years was reported to be 750, and for physicians, surgeons, and general practitioners 952, as compared with 524 for clergymen, priests, &c., and with 1,000 for all males. Inasmuch as persons engaged in these three professions, speaking comparatively, seldom drift into other occupations, and as they live under fairly similar social conditions, there is no very serious reason for doubting that these figures approximately represent the relative rates of mortality due to the varying influence of those different professions. In the case of industrial occupations, however, the comparative mortality figures

are probably far less trustworthy. It is infinitely difficult, for instance, to attribute the excessively high mortality figures for costermongers, hawkers, &c., and for general labourers (2,007 and 2,235 respectively), to the mere influence of occupation, as in the majority of industrial occupations frequent change of occupation, and the effect of social conditions (including housing, feeding, and clothing) in great measure destroy the value of the mortality statistics as a true test of the influence of occupation.

Dr. Dunlop, in the course of his Paper, expressed the opinion that the most important of the probable sources of error and limitation in the published statistics of occupational mortality arise from paucity of the facts on which the calculations are based. There appears, however, to be good ground for agreeing with the expert opinion, expressed during the discussion of the Paper, that change of occupation is a far more serious source of error in the tabulated results than paucity of facts. Advancing age or failing health are constantly the cause of necessary changes of occupation, to say nothing of those changes due to varying demands for labour in different branches of industry. There are, indeed, various forms of manual labour, such as mining, iron and steel manufacture, puddling, &c., which not only forbid the adoption of such occupations by the physical weakling, but necessarily lead to change of occupation in case of health failure. Such industries are, in fact, carried on, as Dr. Ogle pointed out, by a body of comparatively picked men; stronger in the beginning, and maintained at a high level of health by the continual automatic weeding out of those whose strength falls below the necessary standard. In his report on the census in 1881, Dr. Ogle further remarked that even in those industries in which no excessive amount of muscular strength is required there must always be a certain line below which continued employment in the same occupation becomes an impossibility; the weaker individuals, when health fails, are constantly drifting out of each industrial occupation, the death-rates in such occupations being thus unfairly lowered. These weaker individuals necessarily drift among the miscellaneous class of occupations, such as general labourers, costermongers, hawkers, &c., whose rate of mortality is thereby unfairly raised. Occupational statistics appear to show that strong physical labour (in mining and iron and steel manufacture, for instance) is not *per se* prejudicial to life, but it is very doubtful, in the circumstances referred to, how far the natural inference from these statistics can be accepted as trustworthy.

There is another inherent source of difficulty which depreciates the value of the hitherto published attempts to ascertain and tabulate the influence of occupation on mortality from facts recorded in the census returns and in the death register. No one now doubts the direct and inevitable effect of the sanitary condition of the houses of the working classes and their surroundings on the health and the death-rate of their inhabitants, naturally modified by the habits of the workers themselves, and by the social condition and wages of the calling they follow. These conditions, indeed, mainly govern the amount they can expend on rent, food, clothing, &c. Dr. Arlidge,

in his valuable work on "The Diseases of Occupations," points out that "it is a most difficult problem to solve, especially in the case of an industrial town population, how far the diseases met with in it are town-made and how far trade-made; the former almost always predominate. Neglect in weighing these two factors vitiates most published statistics and statements."

It is impossible to doubt the value of the official statistics which have from time to time drawn attention to the excessive rates of mortality in many unhealthy and dusty occupations, more especially those of potters and earthenware manufacturers, cutlers and scissor makers, file makers, gunsmiths, furriers and skinners, lead manufacturers, glass manufacturers, tin and copper miners, and chimney sweeps. Such statistics of mortality probably only err in understating the truly excessive death-rates in these unhealthy occupations. Their value has been fully recognised by Dr. Arlidge and Dr. Oliver in their works dealing with unhealthy trades, and by legislative action tending to reduce the risks incidental to such occupations.

Neither do the foregoing considerations detract from the value of occupational mortality statistics dealing with occupations in which those engaged are, generally speaking, not liable to changes of occupation (as in the case of the learned professions), and in which those engaged may be presumed to live under, at any rate, very similar social conditions. In the case of statistics of most industrial occupations, however, the frequent change of occupation from various causes, and the obvious influence of class and social condition, appear to suggest the desirability of supplementing detailed statistics of occupational mortality with some form of class mortality statistics, in order if possible to determine what proportion of the excess of mortality, among those engaged in many industrial occupations, is due to class and social condition, and how much to the true effect of the occupations themselves. N.A.H.

3.—*The influence of defective physique and unfavourable home environment on the intelligence of school children.* (Eugenics Laboratory Memoirs. VIII.) By David Heron, M.A., Galton Research Fellow in National Eugenics. 60 pp., 4to. London: Dulau and Co., 1910. Price 4s.

This memoir by Mr. Heron is based on data which have been collected during recent years under the general direction of the Medical Officer of the London County Council Education Committee. The data include, for every child, its age, "standard," height and weight, an estimate by the teacher of its mental capacity under five heads ranging from "very dull and backward" to "brilliant," and an estimate by the medical officers of the condition of the teeth; and, for children in certain schools, an estimate of the state of nutrition, of the condition of the clothing, of the degree of personal cleanliness, of the power of hearing, of the condition of the cervical glands and of the tonsils, and adenoids. In all 4,286 boys and 4,474 girls in 14 different schools are dealt with. The following mean correlations are found between intelligence and the several other characters mentioned:—

Character.	Correlation with mental capacity.		Character.	Correlation with mental capacity.	
	Boys.	Girls.		Boys.	Girls.
Height	+ '10	+ '07	Glands	+ '09	+ '08
Weight	+ '06	+ '03	Tonsils	- '01	+ '11
Clothing	+ '04	+ '24	Teeth	+ '08	+ '09
Cleanliness	+ '14	+ '07	Hearing	+ '03	+ '17
Nutrition	+ '01	+ '08			

It will be seen that all correlations are small, and Mr. Heron concludes that (p. 58) "it is quite impossible to assert that the conditions dealt with in this investigation are the sources of the differentiation as to intelligence which we find between one child and another," (pp. 58 and 59) "There is little sensible effect of nurture, environment and physique on intelligence. Some such effect probably does exist, but it is clearly so small that only very accurate and extremely numerous observations based on homogeneous material are likely to lead to results persistently sensible having regard to their probable errors," and again (p. 60) "Some contribution unfavourable home environment and defective physique may make to the degree of intelligence, but even if finally demonstrated, it will be found to be a "second order" contribution, possibly even an indirect effect of race and stock, the abler children being those of fitter parents who give them better homes and better physique. Other factors of environment have yet to be discussed, but so far . . . there is no sign of an environmental condition producing an effect on the mentality of the child at all comparable with the known influences of heredity." These conclusions are of great importance if correct. But are they correct?

More than twenty years ago Dr. Francis Warner commenced to carry out two series of investigations (1888-91 and 1892-94) on mental and physical defects in school-children. These investigations covered 100,000 children in all, or more than ten times as many as those covered by the investigation which forms the basis of Dr. Heron's work. Two of the characters noted by Dr. Warner were "dulness" and "low nutrition"—characters which appear to correspond pretty closely to the "intelligence" and "nutrition" of Mr. Heron's data. Dr. Warner's data and methods were discussed in two papers read before this Society (vol. 56, 1893, and vol. 59, 1896) and were given more fully in a separately published Report (Report on the scientific study of the mental and physical conditions of childhood, 1895): they were also discussed, as illustrations, by the present writer in a memoir on association (*Phil. Trans.*, A., vol. 194, 1900). No reference is made by Mr. Heron to the work of Dr. Warner, and I conclude that he must have been unaware of it, a fact which is to be regretted, for one would have liked to have seen in this memoir some statement of his views as to the divergence between the results of the truly pioneer investigation undertaken by Dr. Warner, and the more recent investigation with which he is

concerned. Dr. Warner's data show a high degree of association between *dulness* and *low nutrition*: they show it for both sexes in different classes of schools (certified industrial schools, poor-law schools &c.), for different races (English, Jews, Scotch, Irish), and for children in different groups of Standards (Infants, Standards I—III, and Standards IV—Ex. VII). The association-coefficients given in the memoir cited are not comparable with Mr. Heron's correlation-coefficients, however, as the association coefficient is a good deal higher than the correlation coefficient for the same data. I have therefore worked out the correlation by Professor Pearson's "four-fold table" method, for a few of Dr. Warner's groups of data, in order to obtain figures comparable with those of Mr. Heron's memoir, and find the following results:—

Correlation between "dulness" and "low nutrition" for—

26,857 boys, 1888-91 investigation	0.53
26,287 boys, 1892-94 ,, 	0.56
23,143 girls, 1888-91 ,, 	0.64
23,713 girls, 1892-94 ,, 	0.58
2,531 boys, Jews, 1892-94	0.43
2,668 girls, Jews, 1892-94	0.47
803 boys, Scotch, 1 Edinburgh school, 1892-94	0.38
807 girls, ,, " " " 	0.61

Mr. Heron admits that in starting his investigation he expected to find large correlations "possibly exceeding 0.5": certainly, the coefficients based on the totality of Dr. Warner's data do exceed 0.5, while those for the two distinct races are only slightly under 0.5. I agree with Mr. Heron that these are the sort of results that might have been expected: why then has he failed to find anything but a very low correlation? The answer, it seems to me, lies in the fact that his data, as to intelligence especially, are almost worthless and can prove nothing. Dr. Warner's was practically a "one-man" investigation: all the physical symptoms—development defects, nerve-signs, and low nutrition—were noted by himself without exception in the first investigation, and with few exceptions in the second; continuity of standard was thus ensured. The return as to "dulness" is stated to have been based on the teacher's report, but this does not quite convey the actual procedure. Dr. Warner himself, I understand, picked out certain children to begin with, and these, subject to the teacher's confirmation, were entered as "dull," together with such other children as were then reported as dull by the teacher (*cf.* Report, &c., p. 11). Dr. Warner's selections, his personal presence, and his explanations, would thus tend to secure a moderate degree, at least, of uniformity. Further, the investigation was voluntary and unofficial, and there would therefore be little probability that any teacher would consider that it might be to his or her disadvantage to enter children as "dull"—a possible source of error, as Mr. Heron suggests (p. 13) in the L.C.C. investigation. The L.C.C. data as to intelligence, Mr. Heron fully and freely admits, are exceedingly bad and enormously affected by the personal equation of the teacher in his use of the terms "very dull

and backward," "under the average," "average," "above the average," "brilliant." The percentage of children who are classed as brilliant ranges from 3 to 33 per cent. (in different schools) among the boys, and from 1 to 33 per cent. among the girls, while in one boys' school which was not used exactly 50 per cent. of the children were classed as brilliant, and in Standard III of that school, out of a class of 95, no fewer than 83 were marked "brilliant" (p. 11). I agree with Mr. Heron that "personal equation and not local differentiation contribute the bulk of the heterogeneity" (p. 12), but he seems to consider that he has eliminated the factors of personal equation and errors of judgment by dealing with each school by itself, and averaging the separate school coefficients so obtained. It is on this point that we differ. I cannot find, in the first place, that all the children of one sex in one school were classified by one and the same teacher: presumably they were classified in each class, mainly at least, by the teacher of that class, so that we would have varying personal equations to consider even within the individual school. Further, it does seem to me that, to a great extent, and unless they are very carefully controlled, the teacher's judgments are *relatively* as well as absolutely valueless—*i.e.*, that we cannot attach any great confidence even to the classifications of one teacher of a single class. His judgment is probably affected to some extent by the age of the pupils: "you find a child age 10 in Standard VI put as *moderate*," writes a correspondent to me, "and one of the same age in Standard II called *brilliant* because his extra experience of the world makes him shine among his younger fellows." Moreover, the quality "intelligence" or "general intelligence" is itself not defined, and it is exceedingly complex; the teacher may tend to lay a very undue stress on one or another aspect of intelligence, to the exclusion of others; it is even possible that his particular mode of teaching, or that of the school, may not tend to bring out at all some capacities that the child possesses. "It is idle to assert," writes Mr. Heron (p. 13), "that there is no such thing as 'general intelligence.'" He has missed the point of the criticisms that have been made against the use of such a term. The objection is clearly stated in the report of the Anthropometric Committee of the British Association—a Committee which has done the most invaluable work for standardising and improving the methods of anthropometry:—"Many of the words in popular usage express characters which are extremely complex resultants of a number of more elementary characters (*e.g.*, intelligence)." It is this complexity of the character, and the consequent scope that is given to genuine differences of judgment, and to absolute errors of judgment, that render it desirable to substitute more simple terms. Mr. Heron himself even goes so far as to think that "it is quite probable that some teachers have confused 'intelligence' with orderly behaviour and quietness, and so have classed some of the weaklings as 'intelligent,' while the physically active and noisy children were regarded less favourably" (p. 22). What weight, either relative or absolute, can be attached to such returns? And if the results can clearly not be accepted in

the case of "intelligence" and "nutrition," what reasons have we for supposing that any greater weight will attach to the other figures given? It is deeply to be regretted that Mr. Heron should have put forward such definite conclusions, of so far-reaching importance, upon so doubtful a foundation.

Amongst the correlation coefficients based on Dr. Warner's data, given above, are included coefficients for Scotch and for Jewish children, as Mr. Heron lays some stress on the fact that the admixture of races in many populations may give rise to fallacious conclusions: the Scotch, rather than the Irish, children were chosen for this purpose, in spite of their smaller numbers, because they were all drawn from one school and thus give correlations directly comparable with the coefficients for single schools given in the body of Mr. Heron's paper. While he is perfectly right in directing attention to the possible fallacy, it is evident that Dr. Warner's relatively large correlations are but very slightly affected by the mixture of races. Indeed, the figures in Dr. Warner's reports show that the divergence in respect of dulness between children suffering from low nutrition and normal children is far too great to be appreciably due to such a heterogeneity: some 30 to 40 per cent. of the low-nourished children are dull, against some 6 to 8 per cent. of the well-nourished. The divergences between the different races as regards both dulness and low nutrition are quite small.

In dissenting from Mr. Heron's estimate of the value of his data, and consequently from his conclusions, we do not desire to imply that the memoir itself is without value: on the contrary, a number of points raised are of importance, and several of the statistical methods that he has used are worthy of notice; for example, the calculation of "corrected school averages" for heights, weights, &c., based on the age-distribution of the total population of school children observed, instead of on the actual age distribution of the children in each school, so that the corrected averages are comparable *inter se*. The use of similar methods is suggested in other cases also. The standard, or position in standard, of the child, corrected for age, it is pointed out, might be used as a measure of intelligence: such a measure would seem reasonable, and it is not clear why it was not adopted in the present memoir. To his paragraph on p. 4 of the memoir, suggesting the correction of the correlation between *character of child* and *environment*, for *character of parent*, we should like to devote some space, but this notice is already unduly long: it is perhaps sufficient to point out that a correlation between parent and child does not necessarily imply heredity. As a warning of the difficulties inherent in any such investigation as that with which he deals, and as indicating possible means of circumventing some of them, Mr. Heron's memoir may, in fact, be commended. I do not think, however, that the material is strong enough—or anything like strong enough—to bear the conclusions given at the end as regards the influence on intelligence of physique and of environment.

G.U.Y.

4.—*The disappearance of the small landowner.* Ford Lectures, 1909. By Arthur H. Johnson. 164 pp., sm. 8vo. Oxford: Clarendon Press. 1909. Price 5s.

The title of this book somewhat begs the question which it is its object to answer. Has the small landowner disappeared in Great Britain? Obviously in a literal sense he has not, and the questions really discussed are whether his numbers are now less than at some former period, and whether present conditions tend to his disappearance. The primary question is statistical, but unhappily no adequate statistics are available. Mr. Johnson starts with a comparison of the number of small landowners in England and France respectively, and points out that according to the return of 1873 (which, however, is notoriously imperfect) there were in England about 260,000 owners of 1 acre and upwards, and about 700,000 owners of less than 1 acre. These figures, however, are not very relevant to the inquiry which, strictly speaking, relates to occupying owners of agricultural land, *i.e.*, yeoman farmers and peasant proprietors. The present number of this class in Great Britain is given in the Agricultural Statistics for 1909 [Cd-5064] as 62,063, being 12.19 per cent. of the occupiers of agricultural holdings in the country. This total includes those who "own or mainly own" the holdings which they occupy, and much the larger proportion are "small landowners," only 2,785 holding more than 300 acres, and only 17,363 more than 50 acres. Mr. Johnson refers to the agricultural statistics of 1896, with which the later returns are not strictly comparable, and claims that they corroborate an estimate which he himself makes.

This estimate is based on what from the statistical point of view is perhaps the most interesting part of the author's investigations. Seeking for evidence of the fact which so many writers take for granted, *viz.*, that small landowners have declined, Mr. Johnson had the happy thought to examine the assessments to land tax, and having sent a circular letter to all the English counties, he discovered that he had "hit upon a perfect mine of evidence," the thorough working of which he commends to future labourers in the field of historical research. He himself has examined the assessments for some 500 parishes, with the view mainly to ascertain whether there was during the period since about 1780, any change in the number of occupying owners, and if so, in which direction. The results of the analysis are tabulated, and the information given will repay careful study. We have compiled the following table which shows the number of occupying owners of land in a certain number of parishes in the counties named at six periods. The dates are not precisely identical in each case, and the number of parishes included in the figures also varies, the figure given in brackets immediately after the county being the number of parishes to which the figures relate:—

Period.	Oxon (30).	Wilts (16).	Kent (37).	Lancashire (25).	Hereford (27).
1780-85	172	172	} 582* {	448	—
1802-04	190	178		371	93
'31-32	171	169	568	323	84
'62.....	161	88	367	78	39
'91-92	153	121	482	114	54
1907.....	212	159	—	—	128

* 1798.

In the case of Lancashire the comparability of the figures appears to have been disturbed by the omission in the two latter years of assessments under 3 acres. Ignoring this county and taking the figures from Oxford, Wilts, Kent and Hereford, it appears that in the 140 parishes represented the number of small landowners at the end of the eighteenth century (1798-1804) was 1,043, and that this number had fallen in 1891-92 to 810, or a decline of over 22 per cent. in little less than a century. This by itself might be considered sufficiently strong evidence of the decay and probable disappearance of the small landowner, but it will be observed that it does not represent the whole case. The period when the disappearance of the small landowner appeared most imminent was in 1862, and during the past fifty years there appears to have been a marked recrudescence of the class. In the three counties for which figures for 1862 and 1907 are given (representing 103 parishes) the number of small landowners increased from 288 to 499, or by 73 per cent.

It must be recognised, as Mr. Johnson points out, that these few samples may not be representative, and that a complete analysis of the records might tell quite a different tale. But at least it must be admitted that three of the counties, Oxford, Wilts, and Hereford, are typically rural, and when a similar tendency is found in all three a reasonable presumption is raised that the same tendency, though in varying degrees, would be found in rural England generally. If this be so, lamentations over the disappearance of the small landowner would seem at the present time to come either too late or too soon. No one acquainted with rural life will be surprised at this conclusion. All through the time of agricultural depression, as well as previously, there has been a constant demand for small parcels of land in the country districts. Nor has the supply been lacking. Any man with money in his pocket can go into almost any county in England and buy a small property to-morrow. It is true that this demand is largely for residential rather than agricultural purposes, and it is true also that when we speak of the small landowner it is impossible to differentiate between the two. The city man who buys 5, 10 or 50 acres in the country is not the class of person whom we mean when we talk of yeoman farmers and peasant proprietors, but he is none the less a small landowner. The Board of Agriculture made an attempt in 1907 to discriminate between persons occupying agricultural land for profit and those who did not regard their holdings as a source of income. Any such

return must, of necessity, be imperfect, but the result of the inquiry showed that 11·4 per cent. of the occupiers of holdings of 1 to 5 acres, and 5·7 per cent. of those occupying 5 to 50 acres, excluded themselves from the agricultural class. Undoubtedly the land of this country as it declines in agricultural value, increases steadily in residential value, and in this fact lies one of the chief difficulties in comparing statistics of its ownership and occupation at different periods.

We have dwelt so long on the statistical aspect of Mr. Johnson's interesting work that we can allude only very briefly to his valuable review of the history of land ownership since the great plague. His preliminary observations on the influence of the land-laws on the distribution of land are very well considered. He points out that "the law of England, so far from *facilitating* the perpetual tying up of estates in one family, distinctly forbids it, and that though the law of primogeniture is the rule of intestate succession, the law can easily be evaded." As he forcibly observes, if the law hampered the sale of land, it would have protected the small owner as well as the large. It is necessary to look elsewhere for the cause of the accumulation of land in single ownership, and Mr. Johnson finds the cause in the habits and prejudices of the large landowners. "The accumulation of landed property has been the passion of the rich." Mr. Johnson discusses the vexed question of the effect of inclosures, and his remarks are distinguished by an impartiality and absence of prejudice which are not always found in writers on this subject. He insists on the essential difference between inclosure of the common field and inclosure of the waste. The cultivation of arable land under the common field system was scarcely capable of defence. It was wasteful, inconvenient, and uneconomical in the highest degree. Nor was its partition in severalty unjust in principle or detrimental to any class. Provided it continued as arable land, its increased productivity should have increased rather than diminished not only the number of persons for whom it provided sustenance, but also the number employed in its cultivation. That great grievances arose and much distress was caused by these inclosures there is ample evidence, but they were mainly caused, not by the inclosure, but by the conversion of the arable land to pasture. By this process the labouring classes are the chief sufferers, by being thrown out of work, in the sixteenth as in the nineteenth century. But whereas in the nineteenth century it was possible for the industrial centres, or the colonies, to absorb the displaced rural population, in the sixteenth century the outlets for surplus labour on the land were very few. It is estimated that in about half of England the total number of persons thrown out of employment from 1445 to 1637 was about 34,000. The author discusses the statistics of inclosure, an interesting question into which we cannot now enter, and points out that although there are no satisfactory figures of the acreage inclosed prior to the eighteenth century, there is no doubt that the extent of the inclosures in the eighteenth and early part of the nineteenth centuries much exceeded any previous period. This, however, was largely inclosure of the

waste, though practically all the remaining common fields were also inclosed before the middle of the nineteenth century. That Parliament deliberately encouraged inclosure, and that in so doing it considered that the interests of the nation were best served, there can be no doubt. If it be admitted that the duty of the Government is to encourage the most effective utilisation of the soil, there can be no doubt that it was right. That hardship was caused to individuals was largely inevitable. Hardship to individuals necessarily attends any change in the conditions of an industry. The rural population had lived under a traditional system in which legal rights were less important than custom and usage. Rights of common were vague and indeterminate, and their exercise was regarded leniently. The popular ideas of ownership of waste or common land were loose. It was difficult to convince villagers that a tract of land which had always been unfenced, and over which they had roamed at will was the property jointly of a limited number of persons, or rather the property of one person over which other persons had certain definite rights. There can be no doubt that in many cases inclosure, both of common fields and of the waste, was carried out harshly, with too strict an insistence on the letter of the law and too little consideration of moral—if not legal—rights which had by long usage been exercised. To this harshness is attributable the spirit of bitterness and sense of injustice which even now survive in many rural parishes. But if Parliament at one time allowed too freely the inclosure of commons, it has in later years done its best to remedy the fault, and since the Commons Act of 1876, it has become as difficult to inclose a common as a century ago it was to prevent it.

The subject with which this book deals is a fascinating one, and we have by no means done justice to Mr. Johnson's painstaking and judicious work. We may note one point for slight criticism. Allusion is made to an "estimate" by Sir James Caird, of the number of acres under cultivation in 1880. The figures are given to prove that "the tendency of late has been for pasturage once more to predominate over arable farming." As official returns of the acreage of crops have been published annually since 1867 (Caird, of course, being perfectly familiar with them), the "tendency" can be measured with exactitude for over forty years. R.H.R.

5.—*Twenty-third annual report of the Commissioner of Labor, 1908. Workmen's insurance and benefit funds in the United States.* 810 pp., 8vo. Washington: Government Printing Office, 1909.

This is the official report presented by Mr. Chas. P. Neill, Commissioner of Labor for the United States of America, to the Hon. Charles Nagel, Secretary of the Department of Commerce and Labor, and by him to the Senate and House of Representatives. The growth in the application of the principles of insurance during the last quarter of a century has been as marked in this country as in the United States, and the report is a timely contribution to the study of a question which is one of very present interest. The

Commissioner finds, as we find, that the freedom of organisation which prevails with regard to workmen's insurance and benefit funds makes it difficult to lay down clear lines of demarcation among the different groups. His analysis extends over 88 national and international labour organisation benefit funds, 530 local labour organisation benefit funds, 50 railroad funds, 461 local establishment benefit funds, 18 hospital funds, and 13 miscellaneous organisations not susceptible of classification. Nearly all of them attempt to accomplish no more than to relieve immediate necessities. The two principal classes of benefits are for death and for temporary disability. This is indicated by the statistics of the national union benefit funds, where the total of all benefits for one year was (if \$5 = 1*l.*) 1,565,824*l.*; of which, 1,044,129*l.* was for payments on death, and 166,552*l.* for temporary disability; all the other benefits, including permanent disability and superannuation, amounting to 355,143*l.* Other benefits found in operation were unemployment, shipwreck, tool, and marriage benefits. The unemployment benefit, we are informed, has made little headway in the United States either as a national or local union benefit. Shipwreck benefit is paid by nine unions, and the allowance, generally 6*l.* per head, was paid to 267 members. They also give from 1*s.* to 2*s.* a week as a tobacco benefit to members when sick, and expended 680*l.* in this way. Copious details are given with regard to each group of societies, and to individual societies belonging to each group, in six chapters corresponding with the enumeration above given. Chapter VII relates to 35 industrial benefit societies, and is equally full in detail.

Chapter VIII deals with the subject of State and Savings Bank Insurance, with regard to which the reporter considers that "practically nothing" has been done in the United States. A new feature in insurance is the provision by the State of Massachusetts, under a law enacted in 1907, for the issue of life insurance and annuity policies for small amounts, especially adapted for working men, by the savings banks of that State. Maryland State has also a co-operative accident insurance fund. Five general forms of policy are issued in Massachusetts:—(1) the straight life policy, on which premiums cease at age 75; (2) an endowment policy, maturing at age 65; (3) an endowment policy, maturing in twenty years; (4) an insurance and annuity policy, which combines a payment upon death with an annuity beginning at age 65. Every payment of the annuity diminishes the amount of the insurance, until the insurance is extinguished, when the annuity will continue to be paid for the remainder of life. The 5th form of policy is for an old-age pension, at age 60 or 65, either with or without an insurance of the amount paid in premiums in the event of earlier death. Under this form of policy the monthly premiums for a pension of 100 per year at age 65 are—for men, non-returnable, 0·48, "returnable," 0·68; for women, non-returnable, 0·57, "returnable," 0·80; which clearly shows that what is called "return of premiums" is really a separate and distinct transaction. In a contingent insurance there can be no such thing as a return of premiums. The premium

is exhausted by the contingency, and there is none of it left to be returned. What happens is that an extra payment is made, by the man, of 0·28 per month, by the woman, of 0·33 per month, for the assurance of an increasing sum in the event of death before attaining the age of 65. The remainder of the premium, 0·48 for the man, 0·57 for the woman, is equally sunk in both cases.

The ninth chapter deals with the legal status of benefit and relief organisations at common law and by statute, and embodies the text of several statutes, with much instructive detail. E.B.

6.—*Deutsche Sterbetafeln für das Jahrzehnt 1891 bis 1900. Bearbeitet im Kaiserlichen Statistischen Amte.* 40 + 215 pp., 4to., with 6 plates. Berlin: Puttkammer and Mühlbrecht, 1910. Price 5 marks.

Those who are familiar with the care and scientific thoroughness which characterise most German statistical work will peruse this handsome volume with high expectations. These expectations will not be disappointed. The tables themselves are preceded by a carefully written introduction, in which the methods of calculation are explained, proofs of the more important formulæ set out, and numerical illustrations given. Among interesting features of this section may be mentioned the following. The chance of dying at

a given age is calculated by the formula $q = \frac{M}{L - \frac{W + D}{2}}$ where

M = the number of persons who die at the given age during the period between two censuses, L = the number who enter on that age, W = the excess of emigrants over immigrants, and D = the difference between the two census returns for the given age.

It is shown that this formula is theoretically more correct than that of Farr, but that the practical difference in the result is not very great, Farr's formula yielding somewhat too high values. For instance, the number of survivors of the initial 100,000 at ages 30, 35 and 40, as calculated by the newer method are 61,843, 59,658, and 56,889; Farr's formula gives 61,978, 59,782, and 57,038 (Prussian figures, 1891-1900). The probabilities of dying are smoothed by Altenburger's method, which consists of the application of a series of third order curves to the probabilities plotted as ordinates, the *abscissæ* being years of age. The method, when carried out, as in some of the cases, to a fifth approximation, is lengthy, but can be performed almost mechanically. The effect on the calculation of the expectation of life, which is produced by allowing for the variation of the mortality coefficient within a year, is examined. The usual assumption that those who die within a year have, on the average, lived through six months of that year, is shown not to lead to an appreciable error.

Leaving these technical points, we may note that the practical conclusions of the work should be gratifying to the German nation. The mean duration of life for males in the seventies, eighties and nineties respectively was 35·38 years, 37·17 years, and 40·56 years. For females the corresponding figures were 38·45, 40·25 and 43·87.

The average number of years of life in the productive period, 15-60, has increased from 36·31 to 37·92 for males and from 36·93 to 38·71 for females. From the useful comparative tables it will be seen that Germany occupies a good place among the nations for ages between 10 and 35; for males between 20 and 25 she is surpassed by England alone. The worst feature in the German records is, as is well known, the high rate of infantile mortality. How unsatisfactory the state of affairs is will be gathered from the following extracts:—

Country.	Number out of 100,000 born who survive the first year.	Country.	Number out of 100,000 born who survive the first year.
Sweden	88,917	Holland	82,681
France.....	83,674	Italy	82,481
Belgium	83,114	German Empire ...	76,614
England and Wales	82,814	Austria	75,028
Massachusetts	82,767		

Within the German Empire the figures vary, from Saxony, with 69,945 at the bottom of the scale, to Oldenburg, with 85,815 at the top. A very helpful feature of the tables for those specially interested in the problems of mortality at early ages is the fact that the death rates during the first year are given in monthly periods, and for the second year at three-monthly intervals.

Enough has been said to indicate the importance and value of this book, which will meet with the full appreciation of statisticians
M.G.

7.—*Sisyphusarbeit oder positive Erfolge? Beiträge zur Wertschätzung der Tätigkeit der deutschen Gewerkschaften.* 112 pp., 8vo. Berlin, 1910.

This brochure is the outcome of a controversy waged between the *Correspondenzblatt* and Herr Karl Kautsky, Editor of the *Neue Zeit*. The subject is the power of the German trade unions to better the condition of their members, and the likelihood of the unions producing as good results in the future as in the immediate past. Herr Kautsky's general attitude appears to have been that the trade unions must act mainly on the defensive and in resistance to attempts to reduce wages, while the *Correspondenzblatt* maintained that the unions can produce positive results in the shape of increased wages and reduced hours of labour. It is this latter view that is argued in the present book. In support of his contentions, the writer adduces statistics of wages and hours of labour from the records of German trade unions, and, in comparison with changes in the level of prices of articles of common use, shows that they reveal an increase in real wages. This desirable result is attributed to the strength of trade union organisation.

Statistics of strikes and lock-outs in recent years are also given. These show that an increasing proportion have turned in favour of the trade unionists, thus lending force to the argument that trade unions are growing in power.

Without attempting to estimate the merits of the controversy,

for we have here only one side of the case, it may be said that while trade unions can doubtless exercise some influence on the rate of wages, it is easy to exaggerate their power in this direction, and to overlook or underrate the part played by economic circumstances beyond the control of the unions.

A.D.W.

8.—*Vorträge der Gehe-Stiftung zu Dresden. Band II. 1910. Beruf, gesellschaftliche Gliederung und Betrieb im Deutschen Reiche. Von Dr. R. van der Borghst. 138 pp., 8vo. Leipzig: B. G. Teubner, 1910. Price 2 marks 80 pf.*

Dr. van der Borghst issues this book as a "small and modest contribution" to the elucidation of some of the results of the German industrial census of 1907, and as an inducement to further efforts in the same direction. The census of 1907 was the third of its kind, its predecessors being in 1882 and 1895, and was undertaken both to ascertain the distribution of the population by occupations, and to determine the number and kind of industrial undertakings or concerns. (Some results of the census have already been given in this *Journal*, vol. lxxii, pages 410 and 646.) Dr. van der Borghst gives the main results of the census, together with corresponding particulars from the earlier censuses, in an appendix of nine tables, and it is the general features of these tables and the conclusions deducible from them that form the substance of his book. A brief description of the census itself is followed by chapters on occupations, social classes (independent, controlling and directing persons, and workers), agricultural undertakings, and industrial concerns. Emphasis is laid on the diminution in the relative importance of agriculture. "The German people has on the whole become industrialised," and "agriculture, with its subsidiary branches, has lost considerably in importance as a branch of industry." Particular attention is also bestowed on the numbers of female wage earners, especially as regards their increase in employments concerned in the manufacture and sale of goods. Young workers under 16 years of age also increased in number since 1895, mainly in a few industries such as mining, manufacture of chemicals, textile spinning, &c., while most other industries reveal a relative falling-off in the numbers of young persons employed. The size, kind, *personnel*, &c., of undertakings are described in some detail.

The book is not critical of the form or methods of the census. To have made it so might have given it an added interest—for example, we should have liked to have read a discussion of the utility of the classification of certain undertakings as *Alleinbetriebe* (concerns giving employment to only one person, and in which no mechanical power is used). As it is, however, the work is a very useful and valuable epitome of the broad results of the census with which it deals.

A.D.W.

9.—*La Vita della Ricchezza. By Emanuele Sella. 252 pp. Turin: Fratelli Bocca, 1910. Price 6 lire.*

This book forms a contribution to the controversy as to the organic nature of human society. It contains analyses of the

impulses and actions of men as they affect the dispersion of wealth through generations. Having discussed the meaning of a scientific "law" and the value and uses of analogies, Professor Sella develops his arguments, purporting to prove the existence of quasi-biological laws controlling the distribution of wealth through the ages. He submits that wealth lives in a biological sense, and finds the law governing such life in the tendency of units of an inferior order to act for the benefit of units of a superior order (*meizofilia*). The line of thought followed in the first part of the book is broadly as follows:—Parents save and leave their wealth to their children. It follows from genealogical considerations that wealth so inherited tends to become distributed in time amongst the whole of human society. Thus parents actuated solely by personal egoism (saving in their own interests only, owing to the uncertainty of life), or by family egoism (under the popular illusion that it is possible to leave wealth to be enjoyed by one's own descendants alone), are in reality acting in the interests of the whole race. Wealth (including "personal capital," such as education, &c., provided by parents for their children) tends further to be distributed in a manner to promote continually new ideals and institutions, owing to the failure of children to continue, in accordance with their parents' illusory expectations, to be guided by the same ideals and desires as themselves. A chapter on the economic evolution of the family contains descriptions, based upon original investigations, of various forms of family organisation in certain districts of Italy.

The second part of the book treats of deviations from the general rule that the dispersion of wealth through the ages tends to a maximum. A number of forces acting in the contrary direction are considered—the effects of consanguineous marriages (the conditions influencing which are stated with some detail), the laws of primogeniture and inheritance, of wasted wealth, and of artificial divisions between countries and races, accentuated in some cases by immigration and emigration laws.

In discussing these questions in their relation to "classical" economic theories, Professor Sella urges that theories based upon the conception of the economic man need to be supplemented in the light of the law of *meizofilia*. His only quarrel with the economists seems to be that, in considering existing economic conditions, they fail to pay sufficient attention to the probable effects of such conditions on the wealth of the future. S.S.

10.—*Das volkswirtschaftliche System der Kapitalanlage im Auslande*. Von A. Sartorius Freiherr von Waltershausen. 442 pp. Berlin; George Reimer, 1907.

The rapid increase during recent years of British capital investments outside the United Kingdom has lately attracted much attention in this country, and has tended to become a matter of party polemic; but although the world-wide movement of which it forms part has long been in progress scarcely any effort has yet been made by scientific inquirers to elucidate its precise nature and effects. More or less elaborate estimates have been made at various

dates by the French, German, and Austrian Governments as to the amounts invested abroad by their subjects; for the United Kingdom we have the recent estimates of Mr. Crammond and Mr. Paish; the subject has been treated briefly or incidentally in a number of British and foreign articles and treatises; but, so far at least as the present reviewer is aware, this book by the Freiherr von Waltershausen remains the solitary instance of an attempt at a comprehensive survey of the whole problem.

That problem is one of great difficulty, and interesting and instructive as the Freiherr von Waltershausen's work undoubtedly is, it cannot be regarded as offering a satisfactory solution. Much information has been brought together, though it is not always well presented, as to the amount of the foreign investments made by various nations; and in this connection the author emphasises a fact which is too often overlooked, namely, that whilst the bulk of such investments are made by the highly-developed countries, in countries which are economically less advanced (such as the British over-sea dominions, Russia, the Balkan States, and the States of South America), there is a very considerable amount of inter-investment between the industrial States themselves. There is a lengthy discussion of the various forms of investment, and the motives, political and economic, which conduce thereto; and in this connection there is an interesting examination of the relations between the great German financial houses and the manufacturers, and the manner in which German loans to foreign States and corporations are made to promote directly the German export trade. The various attempts which have been made from time to time (as in the case of the British Corporation of Foreign Bondholders) to safeguard the interests of investors in countries of dubious credit are described, and suggestions are made for further action in the same direction. The discussion is often so discursive that the conclusions are apt to be hidden, and some important considerations are apparently ignored. The statistics are not always well selected, and it is a little unfortunate that in a volume issued in 1907 the latest trade statistics quoted should, as a rule, be those for 1902. Nevertheless, the book contains much useful and interesting information.

Valuable service has also been done by the Freiherr von Waltershausen in drawing attention to the diversity of foreign investments in respect both of their nature and effects. It is evident that their reaction upon the economic condition of the investing country will differ according as (i.) they are for armaments or economic purposes; (ii.) they represent actual exports of capital, or only the investment of interest earned abroad; (iii.) they are devoted to the establishment of branches of home industrial enterprises, or new industries (competitive or other), or to the development of countries which will be areas for the supply of food-stuffs and raw materials to the investing country; and (iv.) they are, or are not, conditional upon the securing of industrial orders in connection with the undertakings for which the loans are made. Loans for armaments, or which are otherwise directed to the enhancement of the political power of the borrowing State, may possibly be positively harmful to the lending country, since such a country may, as a

consequence of the development which it has facilitated, find itself compelled in its turn to increase its own expenditure upon armaments; but if for political motives it is desirable to make such loans, every effort should be made, in our author's opinion, to secure the resultant industrial orders. Industrial investment abroad may, in the Freiherr von Waltershausen's view, also be harmful by developing that industrialisation of nations which, under the influence of the doctrines expounded by Wagner in "*Agrar und Industrie-Staat*," he regards as a serious peril. Further, it is at all times desirable that the capital should be not only national but also under national control; and the final conclusion therefore is that Germany should follow the example of the United Kingdom and invest mainly in her over-sea dominions, or in regions over which she can consequently exercise an effective political influence (as the United States does to some extent in Central and Southern America). Such countries, moreover, are not likely, in this respect differing from some of the chief British dominions, to become industrial competitors. But although the Freiherr von Waltershausen thus attempts to formulate a policy of foreign investments, he is painfully conscious of the danger with which they are fraught to the moral character of the investing nation, which may sink into a mere "*Reutner-Staat*," as Holland once became, and the United Kingdom is tending to become.

Whilst much of this analysis is sound there is much which is open to criticism, and unfortunately the latter is the more conspicuous. Reference has already been made to the influence upon the author of Wagner's doctrines; he has also adopted a theory of *Weltmachtpolitik*, current among a certain school of German economists, which is apt to militate against scientific impartiality, and in the present case has produced a violent hostility against all who do not accept it, and attacks upon trades unions and German socialists which are worthy only of a political pamphlet. Similarly, as regards the United Kingdom, the author has fallen under the sway of a pessimistic school of writers, whose tendency to depreciate the present economic position and achievements of the British nation has led him into what can be regarded only as a ludicrous misconception. To him the United Kingdom is simply a country inhabited by a decadent and unenterprising race, content to let its industries and commerce decline, and to live on a secure income from unadventurous foreign investments, if only it can enjoy long week-ends and abundant opportunities for the pursuit of sport. The evidence for this is not convincing, sometimes it is absurdly insufficient (as on p. 401); and if the Freiherr von Waltershausen's continental readers have accepted his description and based their calculations upon it, they are likely to be sharply disappointed. P.A.

11.—*The Common Sense of Political Economy, including a study of the Human Basis of Economic Law.* By Philip H. Wicksteed, M.A. xi + 702 pp., 8vo. London: Macmillan and Co., 1910. Price 14s. net.

Political Economy has before now been described by some unfriendly critics, as well as by some of its authoritative exponents

and their enthusiastic disciples, as "sublime common sense"; and the description is not unsuitable, if by it it be meant that the gist of most economic theorising could be conveyed in a few short propositions which, if they were not fully entitled to be regarded as axiomatically correct, might yet be properly considered as the convincing utterances of "common sense" expressed in technical language. This verdict is applicable both to the older notions which Mr. Wicksteed sets aside, and to the newer conception, by the aid of which he claims that contemporary economists have, since the days of Jevons, been accomplishing a much more serious and extensive reconstruction of theory than they themselves have yet realised. He does not, indeed, agree with all the expression they have given to their fresh discovery of an obvious truth. But in the painstaking and suggestive presentation which he has himself offered in this treatise he has avowedly proceeded on the assumption that economic theory is no more and no less than the technical statement of "common sense." He has, as we shall attempt to show, enhanced somewhat the difficulty of his task by striving to attain that extreme simplicity of one unifying idea which has been the attractive bait luring many ambitious philosophies to their ultimate destruction. And yet the resourceful ingenuity by which he beguiles the student through the successive stages of an exposition so elaborate as to occupy more than seven hundred pages, may be ascribed in part to the singleness of the object he has had throughout in view, and in part it may be traced to the inexhaustible command of homely illustration, by means of which he has brought and kept his technical account in close intimacy with the familiar facts of ordinary life.

It is true that the third and concluding section of the book, which is styled "Analytical and Practical," is the shortest of the three, and that, as Mr. Wicksteed himself says, he aims therein at "no more than suggestion and illustration, and makes no claim to systematic completeness even in outline." He raises, indeed, rather than solves a number of problems of lively interest. Still his *aperçus* on questions like gambling as contrasted with insurance, on unemployment in general or as affected by tariff reform, on land nationalisation and on trade unionism, afford an opportunity for shedding fresh, if not very brilliant, light on matters generally obscure and sometimes confused. They indicate at once the possibilities and the limitations of that "marginal theory," of which our author has tried in this volume to supply a "popular but systematic exposition." We might be disposed to lay greater stress on its shortcomings, especially with regard to its practical relevance. We believe that it partakes more largely of the characteristics of an intellectual gymnastic or a dialectical exercise, wholesome as this process may be, than Mr. Wicksteed thinks in his more enthusiastic moods. Even he, if we understand him aright, has moments of misgiving about the possibility of grappling successfully with all its inherent difficulties. But, as used by other expositors, it seems to issue in a new version of an economic "harmony" not very dissimilar from that conceived and stated by the "orthodox" economists of the past. To the objections to that particular conclusion Mr. Wicksteed himself is not insensible.

That older Economics, Mr. Wicksteed declares, has been rendered obsolete by the Jevonian conception he adopts and expounds. But he carries his own destructive criticism to a length to which many contemporary economists might hesitate to follow him; for, in fact, he directs the battery of his assault against some ideas which they have favoured. Despite of his modest disclaimer of originality or priority for his book, he has, in the second section, to which some two hundred pages are devoted, advanced what he describes as "Excursive and Critical" remarks, which seem likely, and are intended, to do irreparable damage to the notions on which he animadverts. We regret accordingly that he has been prevented from developing more fully the attack he has opened rather than completed. For when an author states that he calls for a "revision of the whole theory of increasing and diminishing returns as usually expounded," that "certain general truths of universal application, which were first observed and formulated in relation to land, have been mistaken for specific characteristics of that particular factor of production," and that this procedure has "produced a perfect spawn of misconceptions and misnomers which will long continue to infest economic thought," he will hardly expect that his views will not be considered revolutionary, or that they will be received without close, if not hostile, scrutiny. It is, moreover, to be noticed that, while he accepts, in a sense, the developments of the idea of rent, which have been characteristic of much recent economic thought, he considers that the idea itself has been generally misconceived, and he contends expressly that all notion of an undistributed "surplus" must be dissociated from a correct conception of "marginal significance."

He reaches this conclusion by an examination of those diagrammatic methods which are commonly employed by prominent exponents of the "marginal theory." With some of these he agrees, while from others he differs, in the exclusive emphasis he lays on the determining influence of the consumption as contrasted with the production of wealth. He, however, going further than such expositors, rejects as misleading the familiar diagrams showing the intersection of curves of supply and curves of demand no less absolutely than he discards the inferences drawn usually from "mixtilinear" and "rectangular" areas respecting the different characteristics of rent compared with wages and with interest. Here perhaps his search for a single unifying conception, which will comprehend and explain all phenomena, has led him, like others, to put an excessive strain on the ordinary meaning of common language; and he certainly compels those who would follow his direction to leave the straightforward highway of plain argument and to seek devious hypaths of tortuous dialectic. The declaration, indeed, of the determining importance of the consumption of wealth alone influences all his reasoning, even on such practical matters as tariff reform, and is announced at various stages of the discussion with unvarying emphasis. Yet even he has to admit at one place that it would be "stretching language too far to talk of the seller at a reserved price as being a purchaser." Nevertheless, he insists

that "obviously the effect on the market is precisely the same." And it is in a similar strain that in another place he says that the "supply of one market so far as it is capable of regulation by the action of men constitutes a demand upon some other market." Cost of production, which was favoured too largely perhaps by the older writers, is in fine only admitted into his argument as connected with action which must be properly conceived as determined by anticipated demand. It settles at the most which of two or more alternative courses still open shall be followed.

"Marginal significance" is the phrase with which our author conjures. It is, according to his view, in the content of this expression that the only satisfactory explanation of economic theorising is to be discovered, and to its complete systematic exposition the first and largest section of his book, styled "Systematic and Constructive," is consecrated. In setting forth this unifying and illuminating idea Mr. Wicksteed is careful to maintain that he is merely expounding the principle which governs the common experience of all men in the ordinary affairs of their daily life. He protests against the separation of "economic" men, and will not allow that economic motives or forces are either distinct or recondite. The general principles "which regulate our conduct in business are," he observes, "identical with those which regulate our deliberations or selections between alternatives, and our decisions in other branches of life." For we are "constantly deciding between alternative applications of resources of every kind," and we are continually endeavouring to "administer them to the best advantage in securing the accomplishment of our purposes or the harmony of our inclinations." It is on the "obvious truism" that the "relative urgency with which human wants demand further satisfaction is affected by the extent to which they have already been satisfied" that the marginal theory depends. It is this "common sense" which finds technical expression in the phrase "marginal significance." This is the "human basis of economic law," which Mr. Wicksteed has studied and explained in his elaborate treatise, and by apposite illustration, drawn from familiar experience, he tempts the student to follow him through the successive stages of his reasoned argument. He has evidently devoted an immense amount of thought to the details of his exposition, and it is impossible, in a review like the present, to do more than indicate the value and interest of the work.

L.L.P.

12.—*Other New Publications.**

[These notes do not preclude a fuller review in a later issue of the Journal.]

Abbott (Edith). Women in Industry. A study in American economic industry. With introductory note by S. P. Breckinridge. xxii + 408 pp., 8vo. New York: Appleton and Co., 1910.

[An inquiry into the history and statistics of the employment of women in America. One of the results of the inquiry was to show that while the present tendency was towards an increase in the employment of women, this increase is not more than normal in view of the rate of increase in the population.]

* See also "Additions to the Library," page 582, *sqq.*

Avenel (Vte. G. d'). Découvertes d'Histoire Sociale, 1200-1910. Le socialisme d'hier. La terre aux laboureurs. Les salaires à travers les âges. Dépenses de l'ouvrier et du paysan. Impuissance constante de l'État et des Syndicats sur les prix de vente. Riches du passé et du présent. Inégalité croissante des fortunes et nivellement progressif des jouissances, &c. 334 pp., sm. 8vo. Paris: E. Flammarion, 1910. Price 3 fr. 50 c.

[As may be seen from the title, this book deals with a variety of subjects, all of which have to be taken into consideration in the study of the economic and social history of a country. It will be read with interest in conjunction with the author's monumental history of wages, prices, &c., the fifth volume of which has recently been published.]

Breton (J. L.). Contre la Proportionnelle. Préface de Jules Destrée. 256 pp., sm. 8vo. Paris: E. Cornély et Cie., 1909. Price 2 fr. 50 c.

[A series of articles opposed to proportional representation, which have been contributed to the Press. The introduction of proportional representation into France would result, in the author's opinion, in a period of political stagnation and immobility fatal to the best interests of the country. The working of the system in Belgium and Switzerland is described.]

Cotsworth (M. B.). Railway maximum rates and charges assimilating, comparing and explaining the numerous Railway (Rates and Charges) Order Confirmation Acts of 1891 and 1892 for all the railway companies and traders in the United Kingdom, with the parliamentary (or maximum) classifications. 191 + xvi pp., sm. 8vo. London: G. Allen and Sons, 1910. Price 10s. 6d. net.

[A digest, arranged for permanent reference, of the thirty-five Railway Acts recently enacted by the new "Railway Rates and Charges Order Confirmation Acts," 1891 and 1892.]

Francotte (Henri). Les finances des cités grecques. 293 pp., 8vo. Paris: H. Champion, 1909. Price 7 fr. 50 c.

[Several of the articles contained in this book have already been published. The author does not claim to have exhausted the subject, and pleads for considerate criticism because of the inadequacy of the material at his disposal. The book is divided into two parts: the first part deals with taxation of different kinds which prevailed in the autonomous cities and in the allied cities, and the second part with their financial administration. There are also chapters dealing with the financial administration of the Temple of Delphi, and with exemptions from taxation.]

Haristoy (Just). L'Impôt sur le Revenu. (Ligue contre l'Impôt sur le Revenu et l'Inquisition fiscale.) 881 pp., 8vo. Paris: Felix Alcan, 1910. Price 12 fr.

[An exhaustive study of the working of the income-tax in those countries in which it is already in force, and of the probable effect of its introduction into France. The author is opposed to its adoption in France, and the book has been written under the auspices of the League which has been formed there to oppose its introduction.]

Jacobsohn (Dr. Alfred). Der Kampf gegen die Wohlfahrtseinrichtungen in Grossbetrieben. Kritische Bemerkungen zu der Schrift von Dr. Adolf Günther über Wohlfahrtseinrichtungen und Betriebseinrichtungen. 60 pp., 8vo. Leipzig: C. L. Hirschfeld, 1910. Price 2s.

[A statistical study of social conditions of those employed in the principal industries of Germany.]

Jerons (H. Stanley). The sun's heat and trade activity. 35 pp., 8vo. London: P. S. King and Son, 1910.

[The relation between the sun's heat and trade activity, at first thought, appears remote. This pamphlet, however, suggests that the periodic variation of the sun's condition has some effect upon the activity of the world's commerce and industry, since industry depends on harvests, and when these are abundant, the beneficent influences are far-reaching. The essay has already appeared in the *Contemporary Review* for August, 1909.]

Neisser (Dr. E. J.). Deutschland und Canada. Eine handelspolitische Studie. Mit einer Karte und Diagrammen. 108 pp., 8vo. Berlin: L. Simion Nf., 1909. Price 3s.

[A statistical study of the commercial relations between Germany and Canada, and the influences of the tariff war on their commercial dealings.]

Paillard (Georges). La Suisse et l'Union monétaire latine. Étude économique et juridique. 302 pp., sm. 8vo. Paris: F. Alcan, 1909. Price 3 fr. 50 c.

[This is a retrospective study of the Latin Monetary Union and of its present position. The study is of actual interest owing to recent financial measures in Switzerland, which has belonged to the Union since 1865, the other adhering powers being France, Belgium, Italy, and Greece. There are chapters dealing with the foundation of the Union, the depreciation of silver and banks of issue. Mention is also made of the new National Bank of Switzerland, which will ultimately have the exclusive right to issue bank-notes in that country.]

Riesser (Dr.). Die deutschen Grossbanken und ihre Konzentration im Zusammenhange mit der Entwicklung der Gesamtwirtschaft in Deutschland. Dritte völlig umgearbeitete und stark vermehrte Auflage. xv + 715 pp., 8vo. Jena: Gustav Fischer, 1910. Price 15s.

[An exhaustive study of banking in Germany, and of its concentration in connection with the general development of the German Empire.]

Rowntree (B. Seebohm). Land and Labour. Lessons from Belgium. xx + 633 pp., 8vo. London: Macmillan and Co., 1910. Price 10s. 6d.

[This exhaustive study is written in the hope of contributing to the solution of the problem of poverty, by endeavouring to show its relation to the system of land tenure. The conditions existing in Belgium are considered in great detail, and comparisons are frequently drawn between that country and Great Britain in regard to their respective systems of land tenure. The results of the census of Belgian landowners undertaken by Mr. Rowntree—a remarkable statistical work—are included in this volume.]

Schmüll (Dr. Hermann). Citybildung und Bevölkerungs-Verteilung in Grossstädten. Ein Beitrag zur Entwicklungsgeschichte des modernen Städtewesens. 71 pp., 8vo. Munich: Ernst Reinhardt, 1909. Price 2 marks.

[A statistical study of the growth and development of large towns. The cities described are London, Paris, and the principal German towns.]

Schott (Dr. Sigmund). Alte Mannheimer Familien. Ein Beitrag zur Familienstatistik des XIX Jahrhunderts. 96 pp., 4to. Mannheim: J. Bensheimer, 1910.

[A study in "family statistics" based on inquiries into the history of a number of old Mannheim families.]

Smith (Charles William). Manifesto on international, financial and commercial gambling in "options and futures" (marchés à terme) in conjunction with free trade and protection. 34 pp., sm. 4to. London: P. S. King and Son, 1910. Price 1s. net.

[A pamphlet advocating legislation to suppress or control gambling in "options and futures." There is an historical summary of ancient and modern laws passed in different countries prohibiting gambling operations in agriculture, finance, and trade.]

Smith (Jas. C.). The National Providence Essays. vi + 103 pp., 8vo. London: Kegan, Paul and Co., 1910. Price 3s. 6d.

[These essays deal mainly with the problem of the "systematic incorporation of the Proletariate section of the population into the economic body of the nation," under conditions which will enable them "to attain unto economic security." The author suggests three remedies by means of which this *desideratum* may be attained.]

Thompson (W.). What County Councils can do for the people. 48 pp., 8vo. London: P. S. King and Son, 1910. Price 6d.

[This pamphlet "has been written with the object of placing before the public a few elementary facts about county councils and their work, so that those who take an interest in these bodies, may have in a simple form a general outline of their powers, duties, constitution, and activities."]

Wilson (A. J.). An Empire in pawn; being lectures and essays on Indian, colonial, and domestic finance, "preference," free trade, &c. 336 pp., 8vo. London: T. Fisher Unwin, 1910. Price 10s. 6d. net.

[A collection of essays, some of which have appeared in the Press. Although the statistics quoted in certain cases may be old, the author considers that the arguments still hold good. The increasing indebtedness of this country and of the other portions of the British Empire calls for the most serious consideration, and the author fears the likelihood of renewed financial crises, due to the great and general abuse of credit by governments and by local authorities.]

Brazil. Brazilian Year-book, 1909. Second issue. 8vo. London: McCorquodale and Co., Ltd., 1909. Price 21s. net.

[This volume is a valuable book of reference on all financial, economic, and commercial subjects relating to Brazil. It contains comparative statistics bearing on these subjects for a series of years; and the delay in its appearance has been due to the desire to obtain the latest available information. It is issued under the patronage of the Brazilian Government, and is compiled and edited by Mr. G. P. Wileman, ex-Director of the Commercial Statistical Service of Brazil.]

Germany. Produktions und Konsum-Statistik für Mehl und Kleie im Deutschen Reich. (1878-79 bis 1907-08.) Sonderdruck der Allgemeinen Deutschen Mühlen-Zeitung. Price 1 mark.

[A useful compilation of the statistics of production and consumption of flour and bran in the German Empire in the last thirty years. The pamphlet contains several diagrams.]

Japan. Formosa. The special population census of Formosa, 1905. Report of the Committee of the Formosan Special Census Investigation. 8vo. Tokyo, 1909.

[An abridged translation of the first census of Formosa since its cession to Japan in 1895. There is reason to believe that a statistical inquiry was made by the Chinese, but the method was so imperfect that the returns are entirely useless. The present investigation had for its object to ascertain the real condition of the island at the present day, and the results fully justify the aim of the Census Bureau. The report is illustrated with many diagrams of unusual interest.]

CURRENT NOTES.

The grievous loss which has been sustained by the British Empire in the death of King Edward VII falls with special significance on the Royal Statistical Society. From its earliest years the Society has been encouraged by the favour of the Royal House. From 1840 to 1861 H.R.H. the Prince Consort was Patron of the Society, and took a keen interest in its proceedings, presiding in 1860 at the Statistical Congress held in London in that year. Soon after the death of Prince Albert, H.R.H. the Prince of Wales was pleased to accept the office of Honorary President of the Society, and on his accession to the Throne in 1901 he graciously renewed his association with the Society by becoming its Patron, being succeeded in the office of Honorary President by H.R.H. the Prince of Wales, now His Most Gracious Majesty George V.

Stunned by the sudden blow which has befallen us, it is difficult to realise the full influence of a life devoted so pre-eminently to the public weal and interwoven so closely with every side of the national life. But when the historian comes to record in its completeness the illustrious, but all too brief, reign which has terminated with such tragic swiftness, next perhaps to King Edward's inestimable services in the cause of the world's peace will be chronicled his sincere and human interest in all that pertained to the social welfare and happiness of his people. In that regard the Fellows of the Royal Statistical Society may humbly claim their late Patron as cherishing the objects which they set before themselves. As the favour of King Edward was a constant incentive to those who laboured in that part of the field of social and economic progress which is devoted to the acquisition of statistical knowledge, so the remembrance of his gracious association with the Society will for long years to come remain as an inspiration to faithful service in the common cause of humanity.

His Majesty George V, as Prince of Wales, was pleased to fill the position of Honorary President of the Society since May, 1902. In that capacity he presided at the opening meeting of the Congress of the International Statistical Institute in London in 1905 and delivered an address of welcome. On this and other occasions His Majesty has evinced a personal interest in statistical science. As a member of the Royal Commission on the Supply of Food and Raw Materials in time of war—a subject which involved the

collection and consideration of many figures—His Majesty, as a perusal of the published evidence will show, exhibited a keen appreciation of the statistics produced. The Society, in laying its loyal homage before the Throne may, therefore, feel assured that its labours will be favourably regarded in the future, as in the past, by the Sovereign.

At the ordinary meeting of the Society, on the 24th inst., a paper on "Wages in the Cotton Trade" will be read by Mr. G. H. Wood. The usual dinner of the Royal Statistical Club after the meeting will not take place.

The unexpected death of King Edward has overshadowed every other event. It was so sudden that the business community had no time to become apprehensive. Nothing was known in the City of London of the illness of the King until Friday morning, May 6, when the announcement was made that he was suffering from bronchitis. During Friday morning reports were received that the malady was of a grave character, at mid-day it was known that recovery was impossible, and at midnight that the brief illness had been fatal. Thus apprehension was felt for no longer than a single day. The anxiety caused stocks to be sold on a moderate scale and made bankers less desirous of discounting, and there was a moderate decline in securities and advance in discount rates. On Saturday the Stock Exchange was closed, and practically nothing was done in the money market. The interval which took place before the opening of business on the Monday enabled every one to make a careful survey of the situation. The result was that at the opening of business on Monday, confidence was fully restored, an all-round recovery took place in the prices of securities, and bankers again discounted freely. The business world recognises that the late King was greatly beloved by his subjects, that during his short reign the country has grown stronger, richer and more prosperous even than it was during the long and beneficent reign of Queen Victoria, and it confidently expects that King George V will walk in the footsteps of his father, will promote peace, and will cultivate the friendliest relations with foreign powers. Great reliance is placed in the capacity and wisdom of the new King, and consequently business men look forward with confidence to the continued expansion of the Empire's trade and prosperity. This feeling of confidence in the future was reflected in the recovery in prices of securities that has taken place since the accession of the new King.

A great change has come over the monetary situation in the past month. In March the Bank of England rate was raised to 4 per cent., as its reserve had fallen to under 25,000,000*l.*, and large shipments of cash to the country at the end of March were anticipated. Early in April the reserve was under 23,000,000*l.*, and an advance in the bank rate to 5 per cent. was discussed. At the same time there was a great deal of talk as to the possible disturbance which might result from any further delay in the passage of the Budget. Opinion was divided as to the influence upon the London money market of fresh delay in passing the Budget, but everyone seemed agreed that disturbance of some kind was likely to take place in consequence of the Budget. The better informed held the view that disturbance was likely to arise from the passage of the Budget and the collection of the overdue revenue, involving the payment into the Bank of England of about 29,000,000*l.* of last year's taxation. The situation was also affected by trouble in the cotton trade, arising from the losses of American speculators in cotton. These fears as to the course of the money market, and the weakness of the Bank of England reserve, created a strong demand for gold for London upon New York, and in about three weeks \$32,000,000 (about 6,700,000*l.*) in gold was sent from New York to London. The addition of this great sum to the stock of gold in the Bank of England entirely changed the situation, and early in May the reserve of the Bank reached nearly 29,000,000*l.*, and the stock of gold to about 39,000,000*l.* This strong situation, and a plentiful supply of money in the open market, raised expectations of an early reduction in the Bank rate. So far this expectation has not been realised, but having regard to the level of the foreign exchanges, and the strength of the Bank of England, a reduction in the rate is not likely to be much delayed.

The ability of London to obtain so much gold from the United States arises from the unusually adverse balance of American trade. In the twelve months to the end of March the exports of merchandise from the United States exceeded the imports by only \$172,000,000, in comparison with \$447,000,000 in the previous twelve months. The excess of gold exports exceeded the imports by \$64,000,000 against \$70,000,000 in the previous year, and the excess exports of silver reached \$10,000,000 against \$12,000,000. In the aggregate the excess of exports of goods and of the precious metals over the imports was only \$246,000,000 for the twelve months to March last, against \$529,000,000 in the previous twelve months, and \$547,000,000 in 1907-08. It is now generally recognised that the United States need an excess of exports over imports of between \$500,000,000 and \$600,000,000 a year in order to meet interest

obligations, tourist expenditure, remittances to friends, freights, &c. So small a balance for twelve months as \$246,000,000 has involved large sales of American securities in Europe in order to provide the necessary funds. Including the sales of securities on this side, America was still carrying a considerable floating debt in Europe, and in order to take care of this floating debt the American bankers deemed it desirable to remit the \$32,000,000 of gold to London already referred to. It is understood that the amount of America's floating debt in Europe has now been reduced to relatively small proportions, and, inasmuch as additional large sales of American securities have recently been made in London, Paris, Amsterdam and Berlin, no difficulty is expected to be experienced in financing the adverse trade balance of the United States until the new crops are marketed and exports from America become large in the later months of the year. The great shipments of gold from the United States, and the contraction in the loans of American bankers which resulted therefrom, brought about a severe fall in the prices of American securities, but the renewed ease of the London money market, the fact that no additional gold shipments from the States will be necessary, combined with the recent large sales of securities on this side, have brought renewed confidence to Wall Street. Prices of American securities were recovering rapidly when this note was written.

Mr. Sauerbeck's index-number of prices for April is 78·5, the average of the eleven years 1867-77 being taken as 100. The average index-number shows a slight decline on the index-number for March, which stood at 79·1, but there is not much change for the majority of articles. Wheat, flour, maize, mutton and bacon were a little easier, and, as is usual at this time of year, butter was cheaper. Rice was firmer. Sugar, coffee and tea showed no important change. Iron, tin, lead and copper were somewhat cheaper. Cotton was barely maintained, but fine wool was firmer and tallow and palm oil were a little better. Articles of food, which stood at 75·4, are about 2 per cent. lower than in March, when they stood at 76·8, while materials show no change. There was a gradual rise in the price of silver in the course of last month.

The trade returns for the month of April more than maintain the progress already recorded this year, even after allowance has been made for the fact that, owing to Easter falling in March, the month contained two working days more than the corresponding month last year. Both imports and exports, as may be seen from the subjoined tables, show largely increased values. In imports, cotton manufactures increased in value by 100,618*l.*, and woollen manufactures by 60,540*l.* In exports, however, among yarns and

textile fabrics, cotton yarn shows a reduction in quantity of 1,644,700 lbs. (9·4 per cent.), but an increase in value of 167,414*l.* (18·1 per cent.). Cotton piece goods advanced in quantity by 19,112,300 yards (4·3 per cent.), and in value by 821,073*l.* (16·0 per cent.), the increase being principally due to India. The shipments to China show a decline of nearly 26,000,000 yards. Other cotton manufactures advanced by 924,888*l.* The export of woollen and worsted manufactures showed an increase of 885,767*l.*

Imports.	April, 1910.	Increase (+) or decrease (—) in April, 1910, compared with April, 1909.
Imports, value c.i.f.—	£	£
I. Food, drink and tobacco	21,208,765	— 511,682
II. Raw materials and articles mainly unmanufactured	25,194,776	+ 9,407,939
III. Articles wholly or mainly manufactured	12,975,684	+ 1,484,378
IV. Miscellaneous and unclassi- fied (including parcel post)	176,234	+ 1,062
Total merchandise	59,555,459	+ 10,381,697
Imports of bullion and specie	7,610,402	+ 2,000,458

Exports.	April, 1910.	Increase (+) or decrease (—) in April, 1910, compared with April, 1909.
Exports, of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£
I. Food, drink and tobacco	1,930,865	+ 320,711
II. Raw materials and articles mainly unmanufactured	4,656,457	+ 686,354
III. Articles wholly or mainly manufactured	28,053,722	+ 5,098,660
IV. Miscellaneous and unclassi- fied (including parcel post)	651,171	+ 228,032
Exports of foreign and colonial merchandise, value f.o.b.—		
I. Food, drink and tobacco	1,196,247	+ 90,683
II. Raw materials and articles mainly unmanufactured	8,420,689	+ 2,745,070
III. Articles wholly or mainly manufactured	2,234,333	+ 399,947
IV. Miscellaneous and unclassi- fied (including parcel post)	7,385	— 8,052
Total, British, foreign and colonial	47,150,869	+ 9,561,405
Exports of bullion and specie	4,727,922	— 625,933

Shipping (foreign trade).	April, 1910.	Increase (+) in April, 1910, as compared with April, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	3,250,453	+ 121,690
Total, British and foreign, <i>cleared</i> } with cargoes	4,871,227	+ 134,590

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending April 30, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth- rates.	Mean Death- rates from all causes.
		Births.*	Deaths.		
England and Wales (77 } great towns).....	16,940,895	34,083	18,445	26·2	14·2
Scotland (8 principal towns) }	1,891,936	3,879	2,548	26·7	17·6
Ireland (Dublin registra- tion area and 21 urban districts)	1,151,790	2,681	1,603	30·3	22·7

The most conspicuous difference in the birth-rate, as compared with the previous month this year and with the corresponding month last year, is in the Irish rate, which stands at 30·3, as compared with 27·8 in March, 1910, and 29·4 in April, 1909. The English death-rate is slightly higher than the rate for March, 1910, which was 13·9, but lower than that for April, 1909, which stood at 16·1.

The following returns relating to pauperism, from data supplied by the Local Government Board, in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for April, 1910:—

Selected urban districts.	Paupers on one day in the second week of March, 1910.				Decrease (—) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	81,507	43,939	125,446	261	— 6	— 16
West Ham	5,236	11,941	17,177	222	— 7	— 27
Other districts	75,467	125,485	200,952	213	— 6	— 8
Scotland	11,565	35,798	47,363	222	— 1	— 3
Ireland	16,122	13,066	29,188	260	— 3	— 4
Total, March, } 1910	189,897	230,229	420,126	230	— 5	— 10

According to the Board of Trade *Labour Gazette*, the state of the labour market in March was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
March, 1910	416	701,766	36,543	5·2
February, 1910	416	701,252	40,121	5·7
March, 1909	416	700,654	57,450	8·2

Employment in March continued to improve. The engineering, shipbuilding and textile trades showed increased activity, and there was a seasonal improvement in the building, woodworking and tailoring trades. As compared with a year ago, employment in all the principal industries, except cotton, showed a considerable improvement. In the spinning branch of the cotton trade organised short time to the extent of 15½ hours weekly was worked in mills spinning American cotton, while in the weaving branch employment was also bad; in both branches there was some improvement on the preceding month, but a considerable decline as compared with the preceding year. Returns from firms employing 123,836 workpeople in the week ending March 19 showed an increase of 3·0 per cent. in the amount of wages paid as compared with a month ago, and a decrease of 8·4 per cent. as compared with a year ago.

The Poor Law Commission has issued a report (appendix vol. xviii) on the condition of the children who are in receipt of the various forms of Poor Law relief in England and Wales, by Miss M. N. Williams, M.D., assisted by Miss M. Longman and Miss M. Phillips. The report contains a number of interesting data, statistical and otherwise, as to (1) children whose parents are in receipt of out-door relief, (2) boarded-out children, (3) children in separate Poor Law establishments, and (4) children in the workhouses and workhouse infirmaries. The enquiry is based on a detailed investigation into the conditions subsisting in relatively few unions, and hence the numbers on which given figures are based are sometimes exceedingly small, and, unfortunately, so far as we can find, are not always given. Among the statistical data in part i, we may note tables as to the incomes of families in receipt of out-relief, as to the median and modal rents paid (*mode*, in the report, is apparently used in the sense of the actual rent most frequently paid), and as to the earnings of children of 14 years of age and over. Parts ii, iii and iv are less statistical, but part v contains a report on "an inquiry into the physical condition of poor law children," in which (and in the corresponding appendix) are given some inter-

esting anthropometric data as to children under the Poor Law. The data as to the "nutrition" of the children are of more doubtful value for comparative purposes, but the fluctuations of personal equation can hardly account for the fact that only 8 to 9 per cent. of the children in "separate establishments" are returned by the investigators as suffering from poor nutrition, as against 17 to 20 per cent. of "out-relief children." The percentage of out-relief children classed as dull or mentally defective is amazing—indeed, almost incredible—the figures ranging from 18 to 40 per cent. in the few unions for which returns are given.

The *Journal of the Royal Agricultural Society* for 1909, which has recently been published, contains an article by Mr. W. T. Layton on "Wheat Prices and the World's Production." A chart comparing the annual price of wheat and of all commodities from 1800 to 1909 is interesting, and statistics are given of the supplies of wheat for a series of years. The author omits to give his authority for the figures, many of which in this connection are very uncertain. For example, there are at least five estimates, all of about equal authority, made annually of the world's wheat production. The difference between the highest and lowest of these estimates was 7 per cent. in 1908 and 6 per cent. in 1909. In referring to the alarmist speculations of Sir William Crookes, mention might have been made also of the discussion of his conclusions by Major Craigie and other authorities on the subject. The conclusion of the article agrees in the main with that which has been reached by others from a close analysis of such trustworthy statistics of wheat acreage and supplies as are available.

In the *Nineteenth Century* for the present month there is an article by Mr. A. L. Bowley on "The Insufficiency of Official Statistics." The article is primarily an examination of certain estimates made by Mr. Mallock as to "the possibilities of an income-tax according to the scheme of Pitt," in the March number of the review, but Mr. Bowley travels rather further afield and disusses generally the question whether existing statistics are sufficient to show adequately the extent of the national income and its distribution among individuals and classes. He concludes that the statistics at present published are insufficient to allow even a definite approximate estimate either of the aggregate of the incomes of the people of the United Kingdom, or of the number of persons or of families whose incomes are within any particular limits, but considers that there must be sufficient data in Somerset House for an expert statistician, availing himself of a few carefully-devised

sample inquiries, to complete the solution of the problem. In a final paragraph, he again urges the formation of a Central Statistical Department.

In Part III, Vol. VII of *Biometrika*, issued at the end of last month, there is an interesting paper by Professor Karl Pearson, "On the effect of a differential fertility on degeneracy." Half a century ago, he considers, no correlation would have been found to subsist between fertility and physique in man, while it is practically certain that such a correlation does exist to-day—"the better " mental as well as physical characters can be shown to be associated " with a lessened fertility, and a reproductive selection has been " called into play, which not only impedes but possibly reverses " natural selection." The problem of his paper is to find, to a first approximation, some measure of the secular rate of change which must follow from the correlation of any character of an organism with its fertility. "A statistical study in cancer death-rates," by G. D. Maynard, will also be of interest to many Fellows of this Society; one aspect of the paper is dealt with by Professor Pearson in our *Miscellanea*.

Among the articles of theoretical interest we may notice a memoir by Professor Pearson, "On a new method of determining " correlation when one variable is given by alternative and the other " by multiple categories." On the assumption that the variable given by alternative categories (*i.e.*, *A* and non-*A*) really follows a normal distribution, and that the standard-deviation of the array for the same variable is constant, the correlation-ratio can be calculated. The memoir follows one in the previous issue of the same journal on similar two-rowed tables in which the character subjected to the multiple classification is quantitative. Among the notes, a short paper by Mr. David Heron explains an "abac " or diagram giving the probable errors of the correlation coefficient for all values of *r* and values of *n* from 10 to 1,000. The abac is a very useful one, and if a number of copies could be printed on cards for separate sale it would be very convenient for reference. Mr. Heron, in another note, gives a direct algebraical proof, for the case of three variables, of Mr. Yule's theorem that the standard error of a correlation-coefficient is always $(1 - r) / \sqrt{n}$, whether the coefficient be a total coefficient of correlation or a partial coefficient or any order.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

The Accountant, 1910—

April 16—Assessment of income-tax : *Schooling (William)*.

April 23—The acquisition of a business by a limited company :
Zouche (R. C. de). The practical work of a trustee under a
deed of assignment : *Graves (H. R.)*.

Accountants' Magazine. *May*, 1910—The relation of population
and food production : *Craigie (Major P. G.)*.

Banker's Magazine. *May*, 1910—A disquieting outlook. Progress
of banking in Great Britain and Ireland during 1909. No. 4.
Proportion of cash to deposits. Some problems of the
American situation : *Noyes (A. D.)*.

The Economic Review. *April*, 1910—Some aspects of tariff reform :
Price (L. L.). Social conditions and the principles of 1834 :
Kenyon (Ruth). The taxation of salt in India : *Barker (D. A.)*.
Indian land tenure and the manor : *Bussell (Rev. Dr. F. W.)*.
Legislation, parliamentary inquiries, and official returns :
Dougan (J. L.).

Financial Review of Reviews. *May*, 1910—The finance of new
liberalism : a reply to Sir William Bull, M.P. : *Watt (H. A.)*
and *Hynes (T.)*. The value of stocks. IV. The effect of politics,
stock exchanges, and money markets : *Crozier (Dr. J. Beattie)*.
The underlying principles of geographical distribution of
capital : *Hunter (Prof. T. A.)*. Politics and prices : *Wright*
(*Arnold*).

Journal of Institute of Bankers. *May*, 1910—The finance of war :
Crammond (Edgar). Gilbart Lectures, 1910 : *Paget (Sir John)*.

Journal of Royal Agricultural Society of England. Vol. 70. 1909—
Mr. William Carruthers, Ph.D., F.R.S., F.L.S., F.G.S., &c.,
with an introduction by Charles C. Rogers. Dairy cattle and
the butter test : twenty years' experience : *Mathews (Ernest)*.
The cost of winter grazing in East Norfolk : *Bird (Maurice C. H.)*.
Wheat prices and the world's production : *Layton (Walter T.)*.
Pedigree seed corn : *Beaven (E. S.)*. Agricultural competition :
Bear (William E.). The Woburn experimental station of the
Royal Agricultural Society of England : *Voelcker (J. Augustus)*.
Statistics affecting British agricultural interests.

United Empire : The Royal Colonial Institute Journal. *May*,
1910—The new empire : *Parker (Sir Gilbert)*. The Falkland
Islands : *Allardyce (W. L.)*. Irrigation in Australia : *Collins*
(*Capt. R. Muirhead*).

Surveyors' Institution. *Transactions*. Session 1909-10. Vol. 42.
Part 9—The report on the Royal Commission on the Poor
Laws and Relief of Distress, with discussion : *Dickson (T. A.)*.

UNITED STATES—

Bankers' Magazine (New York). April, 1910—The Stillwell international trans-continental railroad: *Gates* (London). Competition in telegraphic service.

Journal of Political Economy. April, 1910—The futility of marginal utility: *Downey* (E. H.). Pioneer industry in the West: *Lippincott* (Isaac). Food prices and the cost of living: *Magee* (J. D.). Preparations for the census.

AUSTRIA-HUNGARY—

Statistische Monatschrift, 1910—

January—Franz Ritter Von Juraschek. Die Entwicklung der österreichischen Grundbesitzstatistik: *Schiff* (Dr. Walter). Die Ergebnisse der österreichischen Unfallstatistik der fünfjährigen Beobachtungsperiode 1902-06. (Schluss): *Mumelter* (Karl). Die Sparkassen Böhmens in Jahre 1908: *Korompay* (Alfred).

February-March—Untersuchungen über die Entwicklung der Straffälligkeit in Österreich: *Forcher* (Dr. Hugo). Die vorläufigen Ergebnisse der Bewegung der Bevölkerung in Österreich im Jahre 1908. Forst- und Jagdstatistik für das Jahr 1908. Die Tätigkeit des Arbeits- und Dienstvermittlungsamtes der k. k. Reichshaupt- und Residenzstadt Wien: *Palla* (Dr. Edmund).

FRANCE—

Bulletin de Statistique, Ministère des Finances. March, 1910—Produits des contributions indirectes pendant l'année 1909. Les produits de l'enregistrement, des domaines et du timbre constatés et recouvrés en France pendant l'exercice 1908. Les revenus de l'État. Allemagne—La Banque de l'Empire en 1909.

Journal des Économistes. April, 1910—Les arguments protectionnistes en France et aux États-Unis: *Guyot* (Yves). Les clauses sur la valeur du sol du budget anglais de 1909, sont-elles économiquement justifiables: *Price* (L. L.). Les industries françaises au début du xx^e siècle—la brasserie: *Paturel* (Germain). L'état actuel de la question des retraites ouvrières en France: *Bellom* (Maurice). Étude et tableaux relatifs aux modifications apportées par le Sénat à la loi douanière votée par la Chambre des députés: *Cohen* (Edouard). Revue des principales publications économiques françaises et étrangères: *Rouxel* (M.) et *Breton* (René).

Journal de la Société de Statistique de Paris. April, 1910—Statistiques relatives à la tuberculose et à l'alcoolisme au chemin de fer du Nord: *Bernard* (M.). Schéma figurant le mouvement général des prix depuis un siècle et l'effet des variations des prix sur la condition matérielle du ménage d'un ouvrier charpentier à Paris: *March* (L.). Influence des variations des prix sur le mouvement des dépenses ménagères à Paris: *March* (Lucien).

FRANCE—Contd.

La Réforme Sociale, 1910—

April 16—Les abus dans l'application de la législation sur les accidents du travail: *Hans (Pierre)* (*Continued in issue of May 1, 1910*). L'Ecole de la paix sociale, sa vie, ses œuvres: *Auburtin (F.)*.

May 1—Les classes moyennes dans le commerce et l'industrie: *Lepelletier (F.)*. La rémunération du personnel agricole: *Dufresne (Robert)*. Enquête sur l'exode rural. Halinghem et sa population (Pas-de-Calais): *Fourdinier (Jules)*. Chronique du mouvement social: France et Belgique: *Lepelletier (F.)*.

Revue d'Économie Politique. April, 1910—Aperçu de l'histoire des monnaies et du commerce d'argent en France: *Lerasseur (E.)*. La réalité des surproductions générales: Réponse à quelques objections: *Aftalion (Albert)*. J. B. Say et les origines de l'industrialisme: *Allix (Edgard)*. Une théorie négligée: De l'influence de la direction de la demande sur la productivité du travail, les salaires et la population: *Landry (Adolphe)*.

GERMANY—

Archiv für Sozialwissenschaft und Sozialpolitik. Heft 2. 1910—

Studie zur schleswig-holsteinischen Agrarstatistik: *Tönnies (Prof. Ferdinand)*. Das Gesetz des abnehmenden Bodenertrages im landwirtschaftlichen Betriebe. I: *Esslen (Prof. Joseph)*. Wirtschaftsführung und Haushaltsaufwand deutscher Volksschullehrer: *Gerloff (Dr. Wilhelm)*. Kritische Bemerkungen zum österreichischen Gesetzentwurf einer Sozialversicherung: *Salz (Dr. Arthur)*. Sozialdemokratische Pfarrer. Eine Skizze: *Vorländer (Prof. Karl)*. Nochmals "Marx oder Kant": *Schulze-Gaevernitz (Prof. Dr. G.)*. Die Gewerkschaftsbewegung im Jahre 1909: *Lecler (Dr. Emil)*.

Deutsches Statistisches Zentralblatt, 1910—

January—Die Versammlungen der Vertreter der amtlichen Statistik des Reichs und der Bundesstaaten (*continued in February issue, 1910*): *Zimmerman (F. W. R.)*.

April—Kann mit Hilfe der Statistik die Wirkung der Aufhebung von Steuern auf Lebensmittel festgestellt werden?: *Hebling (Ernst)*.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft.

(*Schmoller's*). Heft 2, 1910—Die Wanderungen der Grossindustrie in Deutschland und in den Vereinigten Staaten: *Schumacher (Hermann)*. J. Bentham und Ad. Smith: *Hoffmann (Friedrich)*. Fürst Bismarck und das Bankwesen: *Poschinger (Heinrich von)*. Die Kaffeewertung: *Altschul (F.)*. Das Persönliche im modernen Unternehmertum. II: *Wiedenfeld (Kurt)*. Der vierhundertjährige Prozess: *Bernat (Stephan)*. Autonomie der französischen Häfen: *Büchel (Hermann)*. Reichsarbeitsnachweis und Arbeitslosenversicherung in England. Materialien zur Sozialreform der liberalen Regierung der letzten Jahre: *Huth (Georg)*. Die Pensionsversicherungspflicht

GERMANY—Contd.

Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft—Contd.

der Privatangestellten nach der österreichischen Gesetzgebung : *Post (Heinz)*. Innere Kolonisation und Landarbeiteransiedlung : *Gerlach (Otto)*. Die Produktivität der industriellen Arbeit : *Ballol (Karl)*. Bericht über die 29. Jahresversammlung des Deutschen Vereins für Armenpflege und Wohltätigkeit : *Münsterberg (Emil)*.

Jahrbücher für Nationalökonomie und Statistik (Conrad's). April, 1910—Die Finanznot des Staates und Mittel zu ihrer Hebung : *Gehrke (Franz)*. Die Duisburg-Ruhrorter Schifferbörse und die Bestimmungsgründe der Frachtkurse : *Meyer (H.)*. Die Rentabilität der russischen Aktiengesellschaften : *Claus*. Reichskommission und Statistik über Wohnungsreform und Stadterweiterung : *Strehlow*. Die Brotpreise in Berlin im Jahre 1909 : *Garulze (Hans)*. Der gegenwärtige Stand der Alkoholfrage. Ein Sammelreferat : *Elster (Alexander)*.

Zeitschrift des Königlich Preussischen Statistischen Landesamts, 1910. Abteilung I—Einige Ergebnisse der "Statistik über den Schuldenstand der preussischen Städte und grösseren Landgemeinden am 31 März 1906" : *Tetzlaff (Dr. Oskar)*. Die Gesellschaften mit beschränkter Haftung in Preussen im Jahre 1908 : *Kühnert (Dr. F.)*. Das Personal der Landwirtschaftsbetriebe in Preussen 1907. Ernst Kühn : *Blenck (Dr. E.)*.

Zeitschrift für die gesamte Staatswissenschaft. Heft 2, 1910—Marx oder Kant? *Plenge (Johann)*. Technik und soziale Entwicklung : *Riel (Mar)*. Die Ursachen der industriellen Revolution in Belgien : *Lewinski (Jan St.)*. Die finanzpolitischen Besteuerungsprinzipien in Literatur und Theorie. I : *Vogel (Emanuel Hugo)*. Territorium und Reichsland : *Rosenberg (Werner)*. Die Vereinspreese Deutschlands, Oesterreichs und der Schweiz : *Kootz (Robert)*. Ursprung und Lage der Landarbeiter in Livland. II. (Schluss) : *Tobien (Alexander)*. Zur Kritik des Herrn Tobien über Ursprung und Lage der Landarbeiter in Livland : *Agthe (A.)*.

Zeitschrift für Socialwissenschaft, 1910. Heft 4—Politik und Nationalökonomie. III : *Pohle (L.)*. Die Verwaltung der Freien Gewerkschaften in Deutschland. I : *Schildbach (Bernard)*. Beiträge zur Theorie des Kapitalzinses. IV : *Oswalt (H.)*. Zu viel Statistik? *Feld (Dr. Wilh.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended May 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Bulgaria—

Agriculture. Résultats généraux du recensement du bétail, des oiseaux de basse-cour, des chars et des outils et machines agricoles dans le royaume au 31 décembre, 1905. 4to. 1910. (The Director-General of Statistics.)

Census. Résultats généraux du recensement de la population dans la principauté au 31 décembre, 1909. Livraison 1. 4to. 1906. (*Id.*)

Cuba—

Public Works. Informe sobre los trabajos realizados por la Direccion general de comunicaciones de la republica durante el año 1909. 27 pp., 8vo. 1910. (The National Library.)

Germany—

Mannheim. Beiträge zur Statistik der Stadt Mannheim. Die Gebürtigkeit der Mannheimer Bevölkerung, bearbeitet von Dr. Sigmund Schott. 2 pamphlets, fol. 1905-06. (Dr. S. Schott.)

Produktions- und Konsum-Statistik für Mehl und Kleie im Deutschen Reich (1873-79 bis 1907-08). Sonderdruck der "Allgemeinen Deutschen Mühlen-Zeitung," Charlottenburg. 25 pp., 8vo. 1910. (The Publishers.)

Sisyphusarbeit oder positive Erfolge? Beiträge zur Wertschätzung der Tätigkeit der deutschen Gewerkschaften. 112 pp., sm. 8vo. Berlin, 1910. (M. Hermann Kube.)

Italy—

R. Istituto di Scienze Sociali "Cesare Alfieri" in Firenze. Annuario per l'anno accademico 1909-10. 8vo. 1910. (The Institute.)

Japan—

Formosa. Special population census of Formosa, 1905. Report of Committee of the Formosan Special Census Investigation. 210 pp., diagrams, la. 8vo. Tokyo. 1909. (The Committee.)

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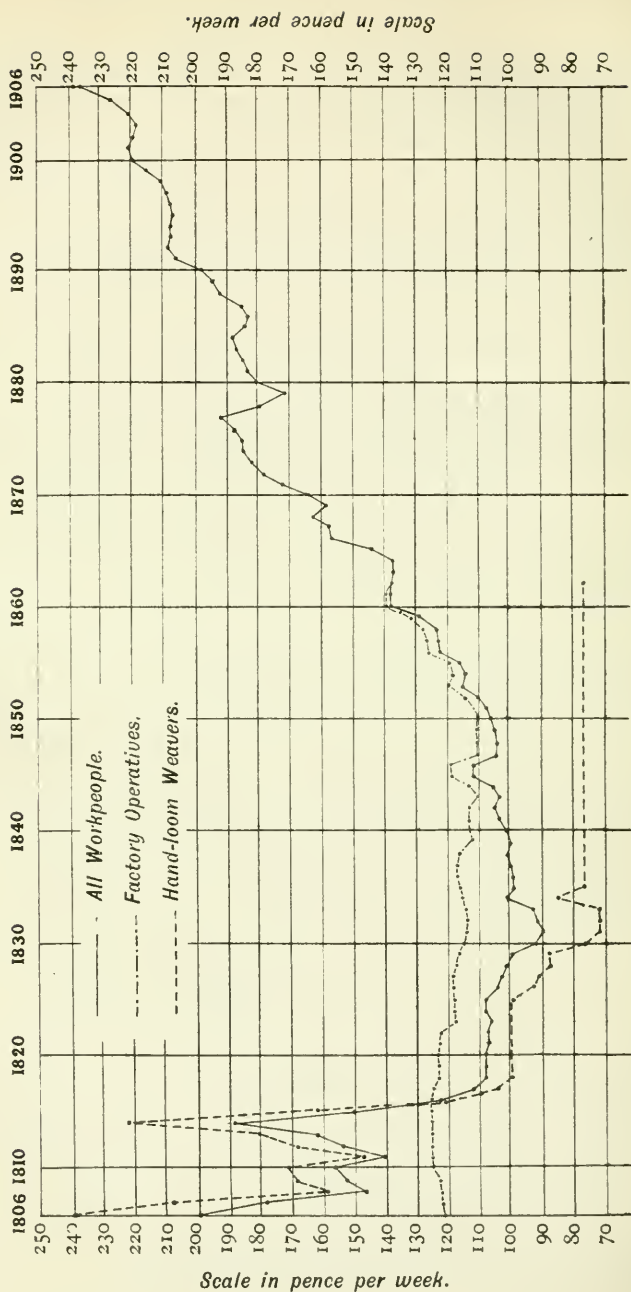
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DIAGRAM ILLUSTRATING THE COURSE OF AVERAGE WAGES OF COTTON OPERATIVES,
1806 TO 1906.



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The STATISTICS of WAGES in the NINETEENTH CENTURY. Part XIX.

—*The COTTON INDUSTRY. Section V. CHANGES in the AVERAGE WAGE of all EMPLOYED, with some ACCOUNT of the FORCES OPERATING to ACCELERATE or RETARD the PROGRESS of the INDUSTRY.*

By GEORGE HENRY WOOD, F.S.S.

[Read before the Royal Statistical Society, May 24, 1910, the President,
Sir J. A. BAINES, C.S.I., in the Chair.]

As the title of this Paper indicates, I propose, in the present instance, to depart from the practice of merely estimating the advance or reduction of wages in the industry under consideration, and discussing the statistical significance of the final estimates, hitherto adopted in the Papers of this series¹, by considering the various changes which have taken place in the structure and *personnel* of the cotton industry; its Collective Bargaining; the effects of Factory Legislation; and such other features as may assist us in interpreting the very great advance in average wages which has taken place during the past century.

In various sections of the series of papers dealing with the cotton industry, published in the January to April numbers of the Society's Journal, there have been given estimates of the changes in average wages of cotton operatives employed in factories at various large centres of the industry, and of the course of wages of hand-loom weavers from 1797 to 1838. For convenient reference, the estimates for factory operatives are reproduced in the following table:—

¹ The papers containing estimates of the course of wages during the Nineteenth Century in this series are, "Agriculture," *Journal*, September, 1899; "Building," March, 1901; "Wool and Worsted of the West Riding," March, 1902, by A. L. Bowley; and "Printers," December, 1899; and "Engineering and Shipbuilding," March, 1906, by A. L. Bowley and G. H. Wood.

TABLE 35.—*Estimates of changes in average earnings of cotton operatives employed in factories in the chief centres of the industry.*

1886 = 100.

District.	1806.	1810-16.	1817.	1818-20.	1821-22.	1823-25.	1826.	1832-33.
Manchester } and district }	75 $\frac{2}{3}$	79 $\frac{1}{3}$	78 $\frac{1}{3}$	77 $\frac{2}{3}$	71 $\frac{1}{3}$	73	73 $\frac{1}{3}$	71

District.	1833.	1836.	1840-41.	1845.	1849-50.	1855.	1860.	1863-64.	1866.	1870.
Manchester....	71	72 $\frac{2}{3}$ 1837.	65 $\frac{2}{3}$	74 $\frac{2}{3}$ 1846.	65 $\frac{2}{3}$	70 $\frac{1}{2}$	71 $\frac{2}{3}$	—	81 $\frac{1}{3}$	88 $\frac{2}{3}$
Bolton	62 $\frac{1}{3}$	63 $\frac{2}{3}$	65 $\frac{1}{3}$	68 $\frac{2}{3}$	67 $\frac{2}{3}$	71 $\frac{1}{3}$	81 $\frac{2}{3}$	80 $\frac{1}{3}$	89 $\frac{1}{3}$	—
Oldham	61 $\frac{2}{3}$	67 $\frac{1}{3}$	66 $\frac{2}{3}$	—	64	—	79	—	86	90 $\frac{2}{3}$
Ashton	65	67 $\frac{2}{3}$	63 $\frac{2}{3}$	—	—	—	—	—	—	—
Stockport	80 $\frac{1}{3}$	91 $\frac{1}{3}$	80	—	—	—	—	—	—	—
Preston	—	—	55 1842.	56	54	56	71	71	85	—
Blackburn	—	—	55	56	56	60	77	73	87	—
Clitheroe	53	—	52	—	51	—	76	—	—	103
Burnley	—	—	—	—	—	—	—	—	—	—
Bury and } Rochdale }	63	66	63	69 1844.	—	—	—	—	—	—
Scotland	65 $\frac{1}{3}$	—	59 $\frac{2}{3}$	69 $\frac{1}{3}$	61	70	73 $\frac{1}{3}$	69 $\frac{2}{3}$	79 $\frac{2}{3}$	86 $\frac{1}{3}$

District.	1871.	1874.	1877.	1880.	1883.	1886.	1891.	1896.	1900.	1906.
Manchester....	92 $\frac{1}{3}$	100	105 $\frac{1}{3}$	97	104 $\frac{1}{3}$	100	—	—	—	112 $\frac{1}{3}$
Bolton	93	101	106 $\frac{1}{3}$	101 $\frac{1}{3}$	103 $\frac{2}{3}$	100	110 $\frac{2}{3}$ 1890.	113	119	121 $\frac{1}{3}$
Oldham	—	97 $\frac{2}{3}$	101 $\frac{2}{3}$	97 $\frac{2}{3}$	102 $\frac{1}{3}$	100	107	110 $\frac{1}{2}$	116 $\frac{1}{3}$	122
Ashton	—	—	—	—	—	100	—	—	—	119 $\frac{1}{3}$
Stockport	—	—	—	—	—	100	—	—	—	137 $\frac{1}{3}$
Preston	91	97	105	96	100	100	110	109	111	121 $\frac{1}{3}$
Blackburn	94	98	105	96	100	100	110	113	119 1901.	124 $\frac{2}{3}$
Clitheroe ...	—	107	108	98	102	100	114	—	123 1902.	131*
Burnley	—	—	—	—	—	100	111	—	118 1899.	133
Bury and } Rochdale }	88	—	—	—	—	100	—	—	—	134 $\frac{1}{2}$
Scotland	—	99 $\frac{1}{3}$	—	—	96 $\frac{2}{3}$	100	114 $\frac{1}{3}$	—	—	120 $\frac{1}{3}$

* 1909, 143.

While this table is before us, we may note the similarity in the course of wages at Bolton and Oldham, and the few numbers we have for Ashton suggest that a complete series for that centre, if we had them, would not differ greatly from these two spinning centres. At Manchester, as would be expected, the course has been peculiar, but not so peculiar as at Stockport, where the relatively small advance between the "thirties" and 1886, and the great advance from that date to 1906, suggests that the year 1886

was abnormal. At Preston and Blackburn the courses have been so much alike that we are able to interpolate missing years in one series from the known figure in the other. At Clitheroe, beginning with very low wages in 1833, we have a greater advance than is found in any other district.

TABLE 36.—*Estimates of average earnings of cotton factory operatives for an ordinary week's work in the chief centres of the industry, 1806-1906.*

(Expressed in pence per week.)

District.	1806.	1810-16.	1817.	1818-20.	1821-22.	1823-25.	1826.	1832-33.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Manchester	131	137	135½	134½	134	126½	127	123

District.	1833.	1836.	1840-41.	1845.	1850.	1855.	1860.	1863.	1866.	1870.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i> 1853.	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Manchester	123	125 1837.	113	129 1846.	114	122	124	—	141½	154
Bolton	111½	114	117	123	120	127½	146	144	160	—
Oldham	127	139	137	—	132	—	163	—	177½	187
Ashton	127	132	124	—	—	—	—	—	—	—
Stockport	134	153	133	—	—	—	—	—	—	—
Preston	—	—	101 1842.	102½	99	102½	130	130	156	—
Blackburn.....	—	—	105	107	107	114½	147	139½	166	—
Clitheroe	93	—	92	—	89	—	133	—	—	181
Burnley.....	—	—	—	—	—	—	—	—	—	—
Bury and Rochdale }	110	115	110	120 1844.	—	—	—	—	—	—
Scotland	96	—	88	102	89	103	108	103	117	—

District.	1871.	1874.	1877.	1880.	1883.	1886.	1891.	1896.	1900.	1906.
	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>	<i>d.</i>
Manchester	160	177	182½	168	180½	173½	—	—	—	195
Bolton	166	181	190	181	188	179	198	203	213	218
Oldham.....	—	201½	209	201½	210	206	221 1890.	228	240	252
Ashton	—	—	—	—	—	195	221	—	—	233
Stockport	—	—	—	—	—	167	—	—	—	230
Preston	166½	177½	192	176	183	183	201	200	203	222
Blackburn.....	180	187	201	183	191	191	210	216	227 1901.	248
Clitheroe	—	188	189	173	179	176	200	—	217 1902.	231 1905.*
Burnley.....	—	—	—	—	—	214	238	—	253 1899.	286
Bury and Rochdale }	153	—	—	—	—	174	—	—	—	234
Scotland	130	146	—	—	142	147	168	—	—	177

* 1909, 252.

When the history of the industry in Scotland is borne in mind, the course of wages there has not differed from that in Lancashire to so great an extent as would, perhaps, be anticipated. From 1833 to 1886 the advance nearly equalled that of the Lancashire spinning centres; from 1870 to 1874 a greater advance is found than in any other place; and from 1886 to 1906 the rate of increase fell in relation to Lancashire, and only equalled two-thirds of the increase of the Lancashire and Cheshire district taken as a whole, though it exceeded that of Manchester and Ashton.

From these index-numbers, with the aid of the Wage Census of 1886 and of 1906, we are able to estimate the average weekly wage per head of all employed in these centres at these dates, and this is the next stage in combining all these figures into an average for the United Kingdom.² This is done in Table 36.

This table speaks for itself. The wages are stated in pence per week, and our business is now to combine them into an average for the United Kingdom.

We know from the Wage Census of 1886 that the average for the United Kingdom in that year was 15s. 2d., and from that of 1906 that in that year the average was 19s. 7d. per head of all employed. In 1833, the census taken for the Children's Employment Commission, covering Manchester, Bolton, Oldham, Ashton, and Stockport, showed an average of 10s. 5d. per head for that district, comprising practically the whole of South Lancashire and Cheshire. In the same year, if what happened on the average at those Lancashire centres for which we have information happened also at Preston, Blackburn, and Clitheroe, the average at these places was rather more in 1833 than in 1840-42. In these years we have estimated in Table 36 that the average wage per head at Preston was 8s. 5d., at Blackburn 8s. 9d., and at Clitheroe 7s. 8d. We are probably safe in assuming that the wage at Blackburn may be taken as typical of the average at Bury, Rochdale, Accrington, and Burnley, while Preston adequately represents Chorley, and Clitheroe would be typical of the lower average earned in the North of Lancashire. Roughly weighing these figures in the proportion of Blackburn 50, Preston 20, and Clitheroe 2, which is a quite sufficient relative proportion of their importance, we get as the average for this district (which I will call the North and North-East Lancashire district, to distinguish it from the part covered by the Children's Employment Census, which I will call the South Lancashire and Cheshire district) 8s. 8d. per head of all employed in 1840-1,

² Ireland, which has had a small cotton industry, is omitted from these figures, as the number employed there has always been too small to have any effect on the result.

indicating about 8*s.* 10*d.* in 1833. In Glasgow in 1833, a census given in the Returns of Wages shows an average of 8*s.* per head, and it is not probable that the inclusion of the other Scottish centres, such as Lanark, would materially affect this. In 1835 and 1839, the Factory Inspectors' Returns of Numbers Employed in Cotton Factories showed that about one-seventh of the total number so employed were in Scottish factories, and by the 1851 Census, when the hand-loom weavers had been so reduced in number as to make the census numbers of persons employed in the cotton industry roughly typical of the comparative numbers employed in factories, we find that of 197,000 persons, about 100,000 were employed in towns covered by the 1833 Census (South Lancashire and Cheshire), and 97,000 were in the rest of Lancashire and Cheshire. Between 1833 and 1851, the industry in North and North-East Lancashire had probably grown proportionately more rapidly than in the southern portion, so that if we take for 1833—

North and North-East Lancashire	2½
South Lancashire and Cheshire	3½
Scotland	1
Total	7

as our weights for that year we are probably as near as we need be to the actual truth. In 1886 the Wage Census returns for the centres comprised in these districts were:—

		Average wage.	
		<i>s.</i>	<i>d.</i>
North and North-East Lancashire	10½	15	1
South Lancashire and Cheshire	7¾	15	9
Scotland	1	12	3
Combined	19	15	2

and the average for the United Kingdom is not affected by the inclusion of Yorkshire and Derbyshire (other than Glossop, included with Stockport). In 1906 the Wage Census shows:—

		Average wage.	
		<i>s.</i>	<i>d.</i>
All Lancashire and Cheshire	22	19	9
Scotland	1	14	9
Combined	23	19	6½

while the inclusion of Yorkshire and Derbyshire raises the average for the United Kingdom to 19*s.* 7*d.*

TABLE 37. *Combination of averages estimated separately for South Lancashire and Cheshire, North and North-East Lancashire and Scotland, with resulting estimated average weekly wages per head of all employed as cotton factory operatives in the United Kingdom, 1833-1906.*

Years.	South Lancashire and Cheshire.		North and North-East Lancashire.		Lancashire and Cheshire.		Scotland.		United Kingdom.	
	Average wage per head.	Relative number employed.	Average wage per head.	Relative number employed.	Average wage per head.	Relative number employed.	Average wage per head.	Relative number employed.	Average wage per head.	Index number. (1906 = 100.)
1833	<i>d.</i> 126	14	<i>d.</i> 106	10	<i>d.</i> 117½	24	<i>d.</i> 96	4	<i>d.</i> 114	52
1836	129	15	108	12	120	27	(100)	4	117	53½
1839-41	125	17	104	15	115	32	88	4	112	51
1845	134	18	108	17	121½	35	102	4	119	54½
1849-50	124	20	105	20	114½	40	89	4	110	50½
1855	133	21	111	23	121½	44	103	4	120	54½
1860	146	23	138	26	142	49	108	4	139	63½
1863-64	143	24	135	28	139	52	103	4	136	62
1866	162	25	159	29	160½	54	117	4	157	71½
1871	175	26	176	32	175½	58	130	4	173	79
1874	189	27	185	34	187	61	146	4	184	84½
1877	197	28	194	36	195	64	(147)	4	192	88
1880	186	29	176	38	181	67	(134)	4	178	81½
1883	193	30	183	39	188	69	142	4	186	85
1886	189	31	181	41	184	72	147	4	182	83½
1891	—	—	—	—	206	76	168	4	201	93½
1896	—	—	—	—	210	80	(168)	4	208	95
1900	—	—	—	—	221	84	(172)	4	219	100
1906	—	—	—	—	237	88	177	4	235	107½

To get the intermediate wages and weights from 1833 to 1886, I have taken the variations indicated by the mean index numbers for Oldham, Bolton, and Manchester to represent South Lancashire and Cheshire, of Preston and Blackburn (slightly adjusted to allow for the more rapid rise at Clitheroe in the "seventies") for North and North-East Lancashire, and have assumed that the relative numbers employed have gradually changed from the proportions indicated in 1833 to those indicated by the Wage Census of 1886. From 1886 to 1906 I have taken the wage indicated by the index numbers for the whole of Lancashire and Cheshire and Scotland respectively, and have ignored the distinction between the North and South Lancashire districts, as it ceases to be of any use. The combination of the whole of these figures is shown in Table 37.

Previous to 1833 our only statement other than for the Manchester district is that at Glasgow wages were practically unchanged for many years. The Manchester district figures do not show much change (between 1806 and 1833 a fall of 6 per cent.), and such changes as they do show are gradual. If we assume that the fluctuations in wages at the few mills represented in our Manchester district figures are typical of Lancashire and Cheshire (a fairly safe assumption for these early years when Manchester employed so large a proportion of the total operatives), and that in Scotland, representing roughly $\frac{1}{7}$ th of the trade (perhaps more in 1806 and less in 1833), wages were unchanged at 8s. per week, we get the following for the period 1806–1833 :—

TABLE 38.

(In pence per week.)

	Weights.	1806.	1810-16.	1817.	1818-20.	1821-22.	1823-26.	1832-33.
Lancashire and Cheshire.....	6	125	131	129	128	127	121	117
Scotland.....	1	96	96	96	96	96	96	96
United Kingdom.....	7	121	126	125	124	123	118	114
Index number, (1900 = 100)	—	55 $\frac{1}{2}$	57 $\frac{3}{4}$	57	56 $\frac{3}{4}$	56	54	52

The accuracy of these figures turns mainly on the correctness of the figure for 1833. We may assume that in 1886 and 1906 the Wage Census Returns were typical, and that in 1833 the Glasgow and South Lancashire and Cheshire figures were also typical. Any error is introduced by the assumption made regarding the Rest of Lancashire. Here we may possibly be 6*d.* per week wrong. If too high by 6*d.* the resulting average for England and Wales is 115 pence instead of the 117 pence shown in Table 38, and for the

United Kingdom 112 pence instead of the 114 there shown. If, on the other hand, the average is understated by 6*d.* the results shown would have to be raised by 2½*d.* for England and Wales and 2*d.* for the United Kingdom. If, as is almost inconceivable, the average for South Lancashire in 1833, namely, 10*s.* 5*d.*, should be correct also for the whole Lancashire and Cheshire area, the United Kingdom average of 9*s.* 6*d.* is too low by 7*d.* On the whole, therefore, we seem quite justified in assuming that our result for 1833 is sound within $\pm 6d.$ per week or approximately ± 5 per cent.

In the earlier years the error may be larger, but not much, and in the intervening years between 1833 and 1886 the later we get the more accurate our figures become, because the margin between the wages of the Northern and Southern districts becomes less, and the relative numbers employed in Lancashire increase. Further investigation may at some later date result in such additional material as will lead to a modification of these figures, but for the present we are tolerably safe in saying that the average wages of cotton factory operatives in the United Kingdom have advanced by more than 100 per cent. between 1832-1850 and 1906; that between 1810 and 1832 a fall of about 10 per cent. took place; that from the lowest point, which was reached in the great trade depression of 1847-49, to the *maximum* of the "seventies" the advance was about 75 per cent.; that a series of reductions reduced the *maximum* earnings of the "seventies" by about 10 per cent., and that by 1906 the average was not only higher than was ever reached before, but was about 20 per cent. higher than the highest point reached in the "seventies" and about 35 per cent. higher than the lowest point of the previous 30 years (*i.e.*, 1879).

Up to this point we have been considering factory operatives only, but in the early days of the industry the hand-loom weavers working in their own homes were more numerous than the factory workers, and it is necessary to devise some means of combining the information relating to these two groups.

The estimates for hand-loom weavers' wages will be found in Section V dealing with these operatives (*Journal*, April, 1900, p. 433), and they are also given in Table 41 below.

So far we have only arrived at estimates for factory operatives for certain years, generally at intervals of three or five years. These we may call our "pivot" points. Considerable materials relating to intermediate years are to be found in the section dealing with changes in list prices,³ and in those giving the detailed information for the Manchester, Oldham, Bolton, and Preston and Blackburn

³ Section I, *Journal*, January, 1910.

districts. By their aid we can compute intermediate numbers for practically every year since 1839. These numbers form our final estimate of the course of wages of cotton operatives employed in factories from 1806 to 1909 and are given later in Table 41, where we shall consider them in conjunction with the numbers employed.

Estimates of numbers employed.

We have now to combine the index-numbers of factory operatives' wages with those of the home-workers to arrive at final numbers representing the whole trade. In doing this we are limited by the fact that we know nothing regarding the course of wages of the cottage spinners, winders, and warpers dependent on the hand-loom weavers; nor can we do more than conjecture as to their numbers. It must be clearly understood, therefore, that, in what follows, this limitation is involved, and that our final results only refer to the factory operatives *plus* the hand-loom weavers.

For this purpose it is necessary to estimate the numbers employed in each branch at various dates between 1806 and the time when the hand-loom weavers had so dwindled away as to be insignificant in proportion to the growing number of factory employees. Unfortunately our material for this is sadly deficient, and we are able at the best only roughly to approximate. Our main authorities are Ellison,⁴ Baines,⁵ and the factory inspectors,⁶ and the whole matter was reviewed at some length by Porter.⁷ Table 39 shows the estimates of these authorities.

With the exception that Baines's figures for 1833 seem too large for the numbers of factory operatives, and that his estimate of the number of hand-loom weavers is the *maximum*, these estimates are quite consistent with each other. They are not, however, quite independent, Ellison relying on Baines and Baines quoting Kennedy with approval for the earlier years, and disagreeing with him as to the power looms in 1829.

Ellison's estimate for 1787 is apparently based on a statement, really for 1788, appearing in the *Manchester Mercury*, April 28, 1788, and probably elsewhere, that 143 mills were erected or in course of erection, two-thirds of which had been erected in 3 years, and that besides there were 20,500 spindles in existence. The estimate appears too high, however, as few factories at that date had so many as 100 employees,⁸ and therefore there would not

⁴ *The Cotton Trade of Great Britain*, 1886.

⁵ *History of the Cotton Manufacture*, 1835.

⁶ Returns of numbers employed in factories, 1835

⁷ *Progress of the Nation*, 1847, Chap. II.

⁸ Chapman, *The Lancashire Cotton Industry*, p. 58.

TABLE 39. — *Estimates of the numbers employed in various branches of the cotton industry.*

Year.	Authority.	Factory spinning.	Power-loom weaving.		All factory operatives.	Hand-loom weavers.
			Operatives.	Looms.		
1787.....	Ellison	60,000	—	—	60,000	—
1813.....	Baines	—	—	2,400	—	—
1815.....	Ellison	100,000	7,000	—	107,000	200,000
1817.....	Kennedy*	110,700	—	—	—	—
1819-21	Ellison	110,000	10,000	—	—	240,000
1820.....	Kennedy*	—	—	14,150	—	240,000
1823.....	Baines	—	—	Large additions	—	—
1824-5	"	—	—	Larger additions	—	—
1826-31	"	—	—	Few additions	—	—
1829.....	Kennedy*	—	—	55,500	—	—
1829-31	Ellison	140,000	50,000	—	190,000	225,000
1832.....	Stanway†	133,000	75,000	—	205,000	—
1832-3-4	Baines	—	—	Enormous increase	—	—
1833.....	"	—	—	100,000	237,000	250,000
1833.....	Porter, quoting Witnesses to 1833 Commission	—	—	—	—	Not less than in 1820,
1835.....	Factory Inspectors	—	—	110,000	—	200,000—250,000
1839.....	"	—	—	—	220,000	—
1844-6	Ellison	190,000	150,000	—	259,000	60,000
1859-61	"	248,000	203,000	—	340,000	5,000—10,000
					451,000	

* Quoted by Porter and Baines, but I have not found the originals.

† Commission on Employment of Children in Factories of 1833. Quoted by Porter.

be, at most, 14,500 operatives employed in them. The addition of 20,000 spinners on hand jennies of 80 spindles each, of which Ellison speaks, may bring the numbers up to his total, but it seems excessive.

The point is not very important, however, as our wages records do not go back so far.

We have no knowledge of the number of hand-loom weavers, other than a statement by Schulze-Gävernitz on the authority of a Committee on Petitions from several Cotton Manufacturers, 1808, that there were then 200,000 (I have not found the original), Kennedy's estimate of 240,000 in 1820, and the general consensus of opinion that they had not diminished by 1833, when they were variously estimated at 200,000 and 250,000. Ellison expressly takes the mean of these numbers for 1829-31 and estimates them at 60,000 in 1844-6 and 5 to 10 thousand in 1859-61. Assuming that they remained unchanged from 1820 to 1831, and that they gradually dwindled away from year to year after until they practically disappear about 1860, we still have to estimate their numbers before 1820.

At that time the power-loom was just beginning to make its influence felt; before that time practically the whole of the vastly increased supply of yarn had to be woven by the hand-loom weavers. As the output per operative employed in spinning increased year by year, the hand-loom weavers would bear no definite proportion to the spinning operatives, and this fact, coupled with the decline of the hand-spinners as the factory operatives increased, makes it impossible for us to assume any connection between the numbers of spinners and the numbers of the weavers using their yarn output. It is absolutely certain, however, that they increased very materially. No improvements of sufficient importance to materially affect the consumption of yarn per loom were made in the hand-loom. Yet the imports of raw cotton averaged in millions of lbs. per annum:—

1781-84	7½	1800-1804.....	57	1815-1819.....	129
1785-89.....	23	1805-1809.....	66	1820-1824.....	154
1790-94.....	30	1810-1814.....	80	1825-1829.....	227
1795-99.....	30				

Up to 1820 this enormous increase must have required more looms to use it; after that date the power-loom may have increased sufficiently to absorb the extra supplies of yarn. If we estimate that increase to have been 4,000 per annum, we get 108,000 in 1787, or not quite twice as many as there were employed in spinning mills. In 1810 we get the 200,000 quoted by Schulze-Gävernitz for 1808. In 1820 we have something over twice as

many hand-loom weavers as spinning employees, and 14,500 power-looms, equal probably to 50,000 hand-loom weavers,⁹ in addition. This, in all, is practically 290,000 hand-loom units to 110,000 power-spinning units. These numbers are therefore consistent with a large increase in the number of power-spinners, an enhanced output per spinning operative and a vastly increased consumption of raw material.

Combining the whole of these estimates, carrying on our numbers of factory operatives by means of the Factory Inspectors' Returns, and assuming all increases or decreases to have been uniform and gradual in between years, but making allowance for the inflated growths of 1823-5 and 1832-4, we arrive at the following "weights" for combining the wages of hand-loom weavers to factory operatives.

TABLE 40.—*Estimates of numbers employed in various branches of the cotton trade, 1787-1862.*
(000's omitted.)

Years.	In factories.			Hand-loom weavers.
	Spinning.	Weaving.	Total.	
1788.....	60	—	60	108
1801.....	83	—	83	164
1806.....	90	few	90	184
1813.....	104	3	107	212
1817.....	111	10	121	228
1820.....	115	11	126	240
1823.....	120	15	135	240
1824.....	122	45	167	240
1825.....	124	49	173	240
1831.....	131	56	187	240
1832.....	132	64	196	227
1833.....	133	75	208	213
1835.....	—	—	220	188
1839.....	—	—	259	135
1847.....	—	—	277	53
1850.....	—	—	331	40
1856.....	—	—	379	23
1862.....	—	—	452	3

In criticising these numbers it should be borne in mind that they are not intended so much for definite estimates of the numbers employed in the cotton industry as for proportions between factory

⁹ Baines says that a hand-loom weaver would weave two pieces of shirting a week; that in 1823 a steam-loom weaver on two looms would weave seven similar pieces; in 1826, on four looms with a tenter, 12 to 15 similar pieces; and in 1833, on four looms with a tenter, 18 to 20 similar pieces. A power loom was, therefore, equal to three and a half hand-looms in 1823-26, and four and a half in 1833.

workers and hand-loom weavers. No account is taken, for instance, of the numbers employed at hand spinning in the early years, or of the winders and warpers for the hand-loom, about whom we know very little. Dyeing and printing is not included, as this should be treated as a separate industry.

We have now arrived at the outline of our estimate of the course of wages of all cotton operatives, and it only remains to fill in the details. This is done in Table 41, where are shown the variations in wages of both factory operatives and hand-loom weavers from 1806 to 1862, and the estimated changes in the final averages of all combined, when allowance is made for the annually changing proportions of factory and non-factory workers. Certain figures are given in italics, indicating that these rest on less sufficient evidence than the rest of our numbers.

When the results shown in Columns 7 and 8 were calculated, they seemed so extraordinary that I felt inclined to reject them altogether. It certainly needs very sound evidence to substantiate a conclusion which shows that the wages of all persons employed in the industry were as high in 1806 as in 1890,¹⁰ that a reduction of over 50 per cent. took place in so short a space as 25 years, and that in the space of 75 years (1831–1906), an advance of 160 per cent. took place. We need therefore to consider the possible sources of error at the weakest places. These appear to be 1806, and about 1831, namely, the highest and lowest points. Of these, we may easily satisfy ourselves about 1831. Our figures show very little variation between 1830 and 1833, and in the latter year we have abundance of evidence. Our table shows an average wage of 9s. 6*d.* for 208,000 factory operatives in 1833, and of this we are only in doubt respecting a small part, the main basis of the figures being in fact a very wide census. The 208,000 taken as the number employed in factories may have been more or less, but not by many either way. Neither, as we have seen, is the average wage open to much doubt. We have, indeed, found that at the utmost it cannot be more than 7*d.* wrong, and is probably within 2*d.* For the hand-loom weavers we have an average of 6s. for 240,000 in 1831, and 213,000 in 1833. The wage is attested by scores of witnesses to the Committee of 1835 and Commission of 1838–40 ;

¹⁰ This is not a strictly accurate description of the change, as of course the winders for the hand-loom are not included ; neither are the cottage spinners. Their inclusion would reduce the average, as they certainly earned much less than the weavers. As we know practically nothing about them, I have been forced to ignore them. It may be noticed, however, that if there was one winder in 1806 for every six hand-loom weavers, and she earned 5s. a week, the average wage of factory operatives, hand-loom weavers and winders combined, becomes 15s. 6*d.* instead of the 16s. 8*d.* shown in Col. 7. This margin of 1s. 2*d.* becomes less every year after

TABLE 41.—*Changes in average wages and numbers employed of cotton operatives employed in factories and as hand-loom weavers from 1806 to 1862, and in the average wages of cotton factory operatives from 1863 to 1909, with the final average for all these workpeople when allowance is made for the changing numbers employed.*

Years.	Operatives in factories.			Hand-loom weavers.		All workpeople.		
	1. Number em- ployed.	2. Weekly wage.	3. Col. 2 as per- centage of 1900.	4. Number em- ployed.	5. Weekly wage.	6. Number em- ployed.	7. Weekly wage.	8. Col. 7 as per- centage of 1900.
	000's.	d.		000's.	d.	000's.	d.	
1806.....	90	121	55 $\frac{1}{3}$	184	240	274	200	91 $\frac{1}{3}$
1807.....	93	122	—	188	207	281	178	81 $\frac{1}{3}$
1808.....	95	123	—	192	159	287	147	67
1809.....	97	124	—	196	168	293	153	70
1810.....	100	126	57 $\frac{2}{3}$	200	171	300	156	71 $\frac{1}{3}$
1811.....	102	126	57 $\frac{2}{3}$	204	147	306	140	64
1812.....	105	126	57 $\frac{2}{3}$	208	168	313	154	70 $\frac{2}{3}$
1813.....	107	126	57 $\frac{2}{3}$	212	180	319	162	74
1814.....	110	126	57 $\frac{2}{3}$	216	222	326	189	86 $\frac{1}{3}$
1815.....	114	126	57 $\frac{2}{3}$	220	162	334	150	68 $\frac{1}{2}$
1816.....	117	126	57 $\frac{2}{3}$	224	123	341	124	56 $\frac{2}{3}$
1817.....	121	125	57	228	105	349	112	51
1818.....	123	124	56 $\frac{2}{3}$	232	99	354	108	49 $\frac{1}{3}$
1819.....	125	124	56 $\frac{2}{3}$	236	99	361	108	49 $\frac{1}{3}$
1820.....	126	124	56 $\frac{2}{3}$	240	99	366	108	49 $\frac{1}{3}$
1821.....	129	123	56	240	99	369	107	49
1822.....	132	123	56	240	99	372	107	49
1823.....	135	118	54	240	99	375	106	48 $\frac{1}{3}$
1824.....	167	118	54	240	99	407	107	49
1825.....	173	118	54	240	99	413	107	49
1826.....	175	118	54	240	93	415	103	47
1827.....	177	118	—	240	90	417	102	46 $\frac{2}{3}$
1828.....	180	117	—	240	87	420	100	45 $\frac{2}{3}$
1829.....	182	116	—	240	87	422	99	45 $\frac{1}{3}$
1830.....	185	115	—	240	75	425	92	42
1831.....	187	114	—	240	72	427	90	41
1832.....	196	114	52	227	72	423	91	41 $\frac{2}{3}$
1833.....	208	114	52	213	72	421	93	42 $\frac{1}{3}$
1834.....	215	115	—	200	84	415	100	45 $\frac{2}{3}$
1835.....	220	116	—	188	75	408	96	43 $\frac{2}{3}$
1836.....	230	117	53 $\frac{1}{2}$	174	75	404	98	41 $\frac{2}{3}$
1837.....	240	117	—	160	75	400	99	45 $\frac{1}{3}$
1838.....	250	116	—	147	75	397	100	45 $\frac{2}{3}$
1839.....	259	112	51	135	75	394	99	45 $\frac{1}{3}$
1840.....	262	112	51	123	75	385	100	45 $\frac{2}{3}$
1841.....	264	113	51 $\frac{1}{3}$	110	75	374	102	46 $\frac{2}{3}$
1842.....	267	113	51 $\frac{1}{3}$	97	75	364	103	47
1843.....	269	110	50 $\frac{1}{3}$	85	75	354	102	46 $\frac{2}{3}$
1844.....	271	113	51 $\frac{1}{3}$	72	75	343	105	48
1845.....	273	119	54 $\frac{1}{3}$	60	75	333	111	50 $\frac{2}{3}$
1846.....	275	119	54 $\frac{1}{3}$	57	75	332	111	50 $\frac{2}{3}$
1847.....	277	110	—	53	75	330	104	47 $\frac{1}{2}$
1848.....	295	110	—	50	75	345	104	47 $\frac{1}{2}$
1849.....	313	110	50 $\frac{1}{3}$	47	75	350	105	48

TABLE 41 *contd.*—Changes in average wages and numbers employed of cotton operatives, &c.

Years.	Operatives in factories.			Hand-loom weavers.		All workpeople.		
	1. Number em- ployed.	2. Weekly wage.	3. Col. 2 as per- centage of 1900.	4. Number em- ployed.	5. Weekly wage.	6. Number em- ployed.	7. Weekly wage.	8. Col. 7 as per- centage of 1900.
	000's.	d.		000's.	d.	000's.	d.	
1850.....	331	110	50 $\frac{1}{3}$	43	75	374	106	48 $\frac{1}{3}$
1851.....	339	112	51	40	75	379	108	49 $\frac{1}{3}$
1852.....	347	114	52	37	75	384	110	50 $\frac{1}{3}$
1853.....	355	120	54 $\frac{2}{3}$	33	75	388	116	53
1854.....	363	118	54	30	75	393	115	52 $\frac{2}{3}$
1855.....	371	120	54 $\frac{2}{3}$	27	75	398	117	53 $\frac{1}{3}$
1856.....	379	126	57 $\frac{1}{3}$	23	75	402	123	56 $\frac{1}{3}$
1857.....	391	127	58	20	75	418	124	56 $\frac{2}{3}$
1858.....	403	127	58 $\frac{1}{3}$	17	75	420	125	57
1859.....	415	131	60	13	75	428	129	59
1860.....	427	139	63 $\frac{2}{3}$	10	75	437	138	63
1861.....	439	139	63 $\frac{2}{3}$	7	75	446	138	63
1862.....	452	137	62 $\frac{1}{2}$	3	75	455	137	62 $\frac{2}{3}$

All workpeople.

Year.	Number.	Weekly wage.	Per- centage of 1900.	Year.	Number.	Weekly wage.	Per- centage of 1900.
	000's.	d.			000's.	d.	
1863.....	—	136	62	1885.....	504	184	84
1864.....	—	136	62	1886.....	—	182	83 $\frac{1}{3}$
1865.....	—	144	66	1887.....	—	185	84 $\frac{2}{3}$
1866.....	—	157	71 $\frac{2}{3}$	1888.....	—	192	87 $\frac{2}{3}$
1867.....	—	158	72 $\frac{1}{3}$	1889.....	—	194	88 $\frac{2}{3}$
1868.....	—	162	74	1890.....	529	197	90 $\frac{1}{3}$
1869.....	—	159	72 $\frac{2}{3}$	1891.....	—	204	93 $\frac{1}{3}$
1870.....	450	165	75 $\frac{1}{2}$	1892.....	—	207	94 $\frac{2}{3}$
1871.....	—	173	79	1893.....	—	206	94
1872.....	—	178	81 $\frac{1}{2}$	1894.....	—	206	94
1873.....	—	181	83	1895.....	539	206	94 $\frac{1}{3}$
1874.....	480	184	84 $\frac{1}{3}$	1896.....	—	208	95
1875.....	—	184	84 $\frac{1}{3}$	1897.....	—	209	95 $\frac{2}{3}$
1876.....	—	187	85 $\frac{2}{3}$	1898.....	—	211	96 $\frac{1}{3}$
1877.....	—	192	88	1899.....	—	214	97 $\frac{2}{3}$
1878.....	483	179	82	1900.....	—	219	100
1879.....	—	172	78 $\frac{1}{2}$	1901.....	523	220	100 $\frac{2}{3}$
1880.....	—	178	81 $\frac{1}{3}$	1902.....	—	219	100
1881.....	—	183	83 $\frac{1}{2}$	1903.....	—	218	99 $\frac{1}{2}$
1882.....	—	184	84	1904.....	523	220	100 $\frac{2}{3}$
1883.....	—	186	85	1905.....	—	226	103 $\frac{1}{2}$
1884.....	—	187	85 $\frac{1}{3}$	1906.....	—	235	107 $\frac{1}{3}$

Note.—The percentages of 1900 are given to the nearest one-third, not as a pretence to accuracy, but for convenience in re-converting them to terms of any other year at any time.

while the number is between the 200,000 and 250,000 estimated by contemporary witnesses. Assuming that the average wage of both factory operatives and hand-loom weavers may be wrong by 6*d.*, and taking the number of hand-loom weavers at 200,000 to 250,000, their wages at either 5*s.* 6*d.* or 6*s.* 6*d.*, and the number of factory operatives at 185,000 to 210,000, and their wages at 9*s.* to 10*s.*, the result which we have arrived at, namely, 90 pence in 1831, 91 pence in 1832, and 93 pence in 1833, is well within the limits of 85 to 99 pence which these variations yield.

In 1806 the case is different. Here we have assumed rather more, and cannot pretend that our result is so accurate. Our wages for factory operatives depend on an assumption for one-seventh; our numbers are entirely assumed; our wages for hand-loom weavers are not based on so much evidence; they are further open to the suspicion that in making retrospective statements the most favourable aspects would be the most likely to be brought out; and our numbers are also little better than conjecture. The question is whether the result for 1806 is too high. In the first place our number employed in factories, while it agrees with the known facts, may be, say, within 10,000. The average wage, for factory operatives, may be 1*d.* higher if the course of wages at Manchester indicates the course at Glasgow, and wages there, in 1806, were 8*s.* 6*d.* per week instead of 8*s.*, and perhaps 3*d.* higher if the North and North-East Lancashire district wage as estimated for 1833 is too low. It is possible, therefore, that our 1806 wage for factory operatives is too low by 4*d.*, but scarcely probable that it is too high. The numbers of hand-loom weavers, estimated at 184,000, can scarcely be more than 6,000 too few, or we get too little increase between 1806 and the time when the power loom came in in sufficient numbers to appreciably affect the consumption of yarn, the supply of which increased annually. It may, however, be too high, possibly by 20,000. Their wages, again, may be wide of the mark, but in view of the careful summary of the Committee of 1835, quoted in Section IV (*Journal*, April, 1910, p. 434), we are quite justified in believing that they cannot have been below 18*s.* On the other hand, they may have been higher. At Bolton we have as the earnings in that year, for various work, 22*s.*, 21*s.*, and 21*s.*, at Wigton 22*s.*, at Glasgow 17*s.* 8*d.* and 32*s.* 6*d.* Wages had fallen by 1810, yet even in that year we have 16*s.* 3*d.*, 16*s.* 10½*d.*, 14*s.*, 16*s.* 5½*d.*, 17*s.* 2*d.*, and 21*s.* as wages on various goods at Manchester, and 17*s.* to 24*s.* 6*d.*, and 13*s.* 6*d.* to 17*s.* 2*d.* at Glasgow. Our 20*s.* in 1806 might therefore even be as high as 24*s.* Hence, our range in that year includes the variations between—

80,000 to 100,000 factory operatives at 9*s.* 6*d.* to 10*s.* 6*d.*

165,000 to 190,000 hand-loom weavers at 18*s.* to 24*s.*

namely, from 14s. 9d. to 20s. compared with the 16s. 8d. which we have estimated. In 1806, therefore, our final average weekly wage may be 2s. too high or 3s. 8d. too low, and our index number, compared with 1900, may be 81 or 110 instead of 91. In any case the result substantiates the conclusion that very high wages were obtained in the very early years of the century, and that a great and rapid fall took place for 25 years, and that the high average of 1806 was not again attained until the "seventies," and probably not until the "nineties."

In each year after 1806 our error becomes less until 1816, when it is at its *minimum*: it increases after to 1831, when it reaches a second *maximum*; and then decreases as the hand-loom workers fall out, until in the "sixties" it comes within negligible limits.

The course of wages of each section and of all combined is illustrated by the diagram.

Assuming that our result is sufficiently correct for all practical purposes, and summarising it in periods as follows:—

		Factory operatives.	Hand-loom weavers.	All workpeople.
<i>Maximum</i>	1806—1809	122	193	170
Falling	1810—1819	126	148	140
Falling	1820—1829	119	95	105
Falling	1830—1839	115	75	96
<i>Minimum</i>	1830—1833	—	—	92
Little change	1840—1849	114	75	106
Factory <i>minimum</i>	1847—1850	110	75	105
Rising	1850—1859	121	75	118
Rising	1860—1869	147	—	147
Rise and fall	1870—1879	180	—	180
<i>Maximum</i>	1874—1877	187	—	187
<i>Minimum</i>	1878—1881	176	—	176
Recovery	1880—1889	185	—	185
Slowly rising	1890—1899	207	—	207
Quick rise	1900—1906	222	—	222

we find that wages have almost steadily advanced for over seventy years and that they now are at least double what they were in the middle of the nineteenth century.

How various classes of operatives have shared this advance.

There are so many different occupations in the cotton industry that it cannot be expected that all will have shared alike in this

advance in wages. The changes in different occupations are interesting in themselves; they also help to indicate where the factors making for improvement have been most operative.

We cannot, however, trace the changes in the occupations as accurately as we can trace the changes in the industry as a whole. In the larger calculation, the errors have room to balance one another. For each occupation taken separately, the material is often lacking in completeness. Nevertheless we can get fairly close so far as the Lancashire and Cheshire area is concerned. In Table 42 are given the estimated average earnings for such types of operatives as the most reliable and complete information can be obtained for. No pretence is made to close accuracy: the results are stated to the nearest 3*d.* per week, except in the Census years; and only intermediate years are taken. We cannot pretend to take this back earlier than 1833.

TABLE 42.—*Estimated average weekly earnings of various classes of cotton operatives in Lancashire and Cheshire, 1833–1906.*

	1833.	1840.	1850.	1860.	1871.	1874.
Blow, &c., room women	7/-	7/-	7/6	8/-	12/-	12/-
Strippers and grinders	14/6	13/-	12/9	14/9	21/-	23/-
Draw frame tenters.....	7/6	7/6	7/-	8/-	12/9	14/6
Slubber „ „	7/6	8/-	8/6	9/-	14/9	15/6
Rover „ „	8/-	8/-	8/6	10/6	15/6	16/-
Throstle and ring spinners....	7/9	8/-	7/6	9/-	12/-	13/-
Self-actor spinners	25/9	22/6	21/9	24/3	30/-	33/-
„ big piecers	9/-	10/-	8/9	10/-	12/-	14/-
„ little piecers	3/6	5/-	5/6	6/6	7/-	8/6
Winders	9/6	9/-	8/6	10/-	13/-	13/9
Reelers	10/-	9/-	9/-	9/6	13/-	13/-
Warpers	11/-	9/-	11/-	11/6	14/-	15/-
Weavers	11/-	10/6	11/-	12/6	14/-	15/-
Dressers and sizers	27/9	26/-	25/-	25/-	30/-	37/-
Weavers' helpers.....	5/-	5/-	5/-	5/-	5/-	5/3

	1877.	1880.	1886.	1891.	1900.	1906.
Blow, &c., room women	14/3	13/-	11/10	13/-	13/9	14/3
Strippers and grinders	22/-	21/6	20/4	26/6	28/6	29/5
Draw frame tenters.....	16/-	14/6	14/9	18/6	19/6	20/-
Slubber „ „	17/-	15/-	15/4	18/-	19/-	19/6
Rover „ „	17/-	15/-	15/4	18/-	19/-	19/3
Throstle and ring spinners....	13/6	12/-	12/6	14/-	15/-	15/7
Self-actor spinners	34/-	31/-	31/3	36/-	39/-	41/5
„ big piecers	14/-	14/-	14/1	15/3	16/9	17/10
„ little piecers	8/6	9/-	9/9	10/6	11/3	12/-
Winders	14/-	13/-	13/-	14/-	14/6	15/3
Reelers	13/-	13/6	13/-	13/-	13/6	13/10
Warpers	17/-	16/-	18/2	18/9	20/-	21/1
Weavers	17/-	16/-	17/1	17/11	19/-	20/6
Dressers and sizers	40/-	35/-	35/2	36/-	37/-	40/-
Weavers' helpers.....	5/6	5/3	5/3	5/9	6/-	6/3

All classes will be seen to have shared in the advance, but the weavers' helpers have shared least. Their compensation is that they do not remain helpers very long, but become weavers themselves. Since 1850 the frame-tenters' wages have increased by well over 100 per cent. (drawing-frame tenders' wages have increased by nearly 200 per cent.), and so have those of strippers and grinders, piecers, and ring spinners. Reelers have only risen by about 50 per cent, but winders, warpers and weavers have increased by 80 to 90 per cent.

Influences affecting average wages.

There are four chief causes of change in the average wage in an ordinary week of all employed, and it is interesting and instructive to examine the growth of wages in the cotton industry, and try and separate these influences. The four causes are:—

- (a) Advances or reductions in piece prices or time-work rates;
- (b) Changes in hours of labour;
- (c) Changes in the proportions of skilled and unskilled, the distribution of occupations, or the relative numbers of men, women, boys, and girls; and
- (d) Changes in the efficiency of operative or machine.

We cannot expect to state exactly what proportions of the change in the average over a particular period are due to any of these causes, but we can make some close approximations.

In Section I¹¹ will be found an account of the changes in the levels of piece prices under certain well-known "lists" which now practically govern the trade, and of the changes in time rates for certain classes of operatives at two mills. It is almost impossible to combine these records, and say that wage rates are definitely 5, 10, or 15 per cent. above or below what they were in 1860 or 1870. The levels of list prices in 1860 and 1906 were:—

TABLE 43.

	1860.	1906.
Weaving list	105	100
Oldham spinning	(90 ?)	105
„ male card-room	90 ?	120 ?
Preston spinning.....	107½	112½
Bolton	105	105
„ card-room	105	110
„ male card-room	105	125
Ashton spinning	100	110

¹¹ *Journal of the Royal Statistical Society*, January, Table I.

The three query marks indicate that these are the probable levels, but that the records are incomplete.

The indications are that, taking into account the relative numbers employed in the spinning and weaving branches, and the various adjustments of prices to new conditions, payments for extras previously not paid for, &c., the average rate of payment in 1906 was about 5 or $7\frac{1}{2}$ per cent. above that of 1860. This advance does not seem very great when we remember that the average wage of all employed has advanced by 69 per cent. We shall be fairly within the mark if we estimate it at $7\frac{1}{2}$ per cent., or 10*d.* per head.

The effects of legal reductions of hours on wages.

The question of the effects of factory legislation on the cotton industry has already been discussed by me in the *Society's Journal*,¹² and it is not my present purpose to go over the ground again. In making investigations for the present paper, however, I have acquired some further information, and it will not be out of place if it is briefly considered here. We need only refer to the effect of reductions of hours on wages, and can say little about that of 1847, except that our index-numbers show the average wage for factory operatives to have been:—

	<i>d.</i>		<i>d.</i>
1844	113	1849	112
1845	119	1850	112
1846	119	1851	113

substantiating the conclusions arrived at in 1902 that the "Ten Hours Act" was accompanied by a reduction of wages, but not by any means *pro rata* with the reduced hours (69 to 60). In a large mill in the North and North-East Lancashire district, time workers were reduced *pro rata* with the reduced hours, but piece workers generally made up their former earnings without any advance in piece rates, as soon as trade, which was very depressed in 1847 and 1848, revived.

In 1875 the hours were reduced from 60 to $56\frac{1}{2}$ per week. Generally speaking, the time workers had their former wages paid for the shorter hours.¹³ Our index-numbers for this period indicate

¹² "Factory Legislation Considered, &c.," by George H. Wood, *Journal of the Royal Statistical Society*, June, 1902.

¹³ *E.g.*, the Blackburn employers resolved to make a *pro rata* reduction for time workers, but failed; and the Oldham employers resolved to pay the former rates to all dotal hands. The piecers generally succeeded in obtaining the 60 hours' rate for $56\frac{1}{2}$ hours. See Section II, Oldham and District, *Journal*, February, 1909, p. 158.

the following average earnings per head in pence, during the 3 years before and after the change in hours :—

1872.....	178	1874.....	184	1876.....	187
1873.....	181	1875.....	184	1877.....	192

It will be seen that as wages were rising throughout the period of 6 years, the reduction of hours arrested the advance for 1 year.

The manager of a large spinning mill informs me that while they made no change in weekly rates for fatal operatives, and no change in piece rates, their average earnings fell 7 per cent. between the period preceding the reduction of hours on January 1, 1875, and the middle of the year. The previous hours had been 59. Here the reduction in hours brought a definite decrease in earnings. By 1876, however, the average was higher than ever before, and again no changes in rates had taken place.

In a large weaving establishment which we are unable to identify, but for which we have full particulars from an "average" book, the following were the average earnings for four full weeks in November–December, 1874, and four full weeks January–February, 1875 :—

TABLE 44.

	1874. Nov.–Dec.	1875. Jan.–Feb.	Percentage change.	1875. Sept.–Oct.
Winders	12/3	12/0·8	–1·4	12/4
Warpers	17/1	16/5·4	–3·6	16/10
Dressers	34/3·7	32 8·25	–4·7	33/2½
Twisters-in	14/9·2	14/3	–3·4	15/–
Drawers-in	18/9·3	17/9·9	–5·0	17/9½
Weavers, per loom	6/1·18	5/9·01	–5·9	5/8·44

Here the reduction of hours would presumably have been, as was general in the weaving districts, from 60 to 56½, *i.e.*, 5·83 per cent.

All these operatives are piece workers. In the case of the weavers the reduction in earnings was almost exactly equal to the reduction in hours. In the other cases it was less, until in the case of the winders it was about one-fourth of the reduction in hours. As would perhaps be expected, the least reduction came where there was least machine-regularity and most could be gained by personal application. With the weaver the loom, being quite constant in its running, would probably have to be speeded before the effect of the reduction of hours could be regained. With the others there is a margin of personal activity which increases through the processes, and is greatest with the twisters-in and

winders. In each case, however, the reduction of hours brought a reduction of earnings, and in each case the reduction was regained before two years had passed.

This is quite confirmatory of the conclusions arrived at in my earlier paper, namely, that the limitation of the hours of labour, both in 1847 and in 1875, probably caused an immediate, but not *pro rata*, reduction in earnings, that the reduction so caused was made up within a very short period, and that the limitation did not prevent wages from soon attaining a distinctly higher level than had been attained under similar conditions of prosperity previous to the reduction of hours. We cannot say that an advance in earnings followed because of the reduction of hours, but we have as yet failed to find a case where reduction of hours has not been followed in a very few years by higher earnings for the less hours than were formerly obtained in the longer working week.

The Act of 1901, which again reduced the hours, this time from $56\frac{1}{2}$ to $55\frac{1}{2}$, apparently failed to have any perceptible effect on earnings. As one manager put it to me, "We had a whip-up and were more stringent as to the cleaning time." This probably happened in most cases. The falling off in trade which came in 1902, though not great, obscures the question too much for any fine measurement of the effect of reducing the working week by less than 2 per cent., and we should require an investigation into a number of cases with full knowledge as to the state of trade in each mill before we could be sure of any conclusion on the matter.

We thus arrive at the negative conclusion that reductions in hours of labour have not prevented wages from rising. We may, therefore, ignore the question which is naturally raised in considering the causes of the advance, namely, "How much higher would wages have been if the old hours had been continued?" We have no evidence that they would have been any higher. The operatives have soon earned as much in the short week as in the previous long one, because they have drawn on their "reserves of personal efficiency" and the organisation of the work has been improved and the machines speeded.

Increment due to changes in "personnel."

Taking next the changes in the *personnel* it will be convenient to trace these at different periods. From the Factory Inspectors' returns we find the proportionate numbers of children, young persons, and adults to have been:—

TABLE 45.

	1835.	1850.	1862.	1868.	1874.	1878.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Children, — 13.....	13·1	4·5	8·8	10·3	13·9	12·8
Male, 13—18	12·4	11·2	9·1	8·5	8·3	7·2
Male, + 18	26·4	28·8	26·4	26·1	24·1	25·1
Female, + 13	48·1	55·6	55·7	55·1	53·7	51·9

	1885.	1890.	1895.	1901.	1904.	1907.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Children, — 13.....	9·9	9·1	5·8	4·0	3·4	3·2
Male, 13—18	8·0	8·2	7·8	7·1	7·1	7·9
Male, + 18	26·1	26·8	27·6	28·1	28·9	28·3
Female, + 13	56·0	55·9	58·8	60·8	60·6	60·6

From this we see that some extraordinary changes have taken place. The continuous diminution in the employment of children and lads and the successively increasing employment of women and girls without reducing the proportion of men, but indeed tending to increase it, would of itself raise the average wage of all considered together.

The division of ages adopted in the Wage Census is not quite the same as that of the Factory Inspectors' returns, the Census age for adult males being 20 years and the Factory Inspectors' only those of 18 years and up. To balance matters I have taken all the big piecers and male 4-loom weavers in the Wage Census from the "boys" and included them with the "men." This gives the following:—

TABLE 46.

	Factory Inspectors' Returns.			Wage Census, 1906.	
	1835. Per cent.	1862. Per cent.	1907. Per cent.	Wage.	Per cent.
Men	26·4	26·4	28·3	28/9	30·2
Lads and boys	12·4	9·1	7·9	11/7	8·7
„ half-timers.....	6·9	4·9	1·5	3/6	1·5
Women	30·8	(39·0)	45·7	18 8	44·5
Girls	17·3	(16·7)	14·9	11/-	13·5
„ half-timers	6·2	3·9	1·7	3/-	1·6
Average wage in 1906 if employed in the proportions stated	} 17/2	18/-	19/6	—	19/7

The proportions for women and girls in 1862 have been interpolated on the basis of a nearly uniform rate of change between 1847

and 1907. The actual numbers are not given by the Factory Inspectors. The Wage Census average in 1906 comes out a trifle too high, as slightly too large a proportion of men were returned. If the proportions of men, women, lads, girls, and half-timers had been returned as the 1907 Factory Inspectors' return shows to have been employed in that year, the average wage would have been 19s. 6d. If, however, the proportions had been the same as those of the Factory Inspectors' returns of 1835, the average wage would only have been 17s. 2d., and if the proportions had been as in 1862, the average would have been 18s. Thus we find an advance of 2s. 4d. in 61 years, due to changes in the *personnel*. Most of this is obviously caused by the reduction of the half-timers.

Even between 1886 and 1906 the advance due to the reduction of half-timers is quite marked. If we take the average wage of full-timers only according to the numbers returned at each Wage Census, the advance is from 16s. 4d. to 20s. 2d., or by 24 per cent.; and if we take the 1886 numbers and apply them to the 1906 wages, we get 19s. 11d. as the average wage, and 22 per cent. as the advance. In 20 years, therefore, the average of full-timers has advanced by alterations in the proportionate numbers employed by about 3d. per week, or 2 per cent. This is almost negligible. Including the half-timers, we get the following details:—

TABLE 47.

	1886.		1906.		Advance 1886—1906
	Per cent.	Wage.	Per cent.	Wage.	
Men*	26·3	23/7	30·9	28/10	+ 5/3
Lads and boys, full-timers	9·1	9/11	9·4	12/-	+ 2/1
„ half-timers	3·8	2/11	1·6	3/6	+ 7d.
Women	44·4	15/3	43·0	18/8	+ 3/5
Girls	11·2	8/9	13·4	11/-	+ 2/3
„ half-timers	5·2	2/8	1·7	3/-	+ 4d.
	100·0	15/2	100·0	19/7	+ 4/5
Average with 1886 numbers and 1906 wages	} —	—	—	18/6	+ 3/4

* Including lads and boys, big piccers, but not lads and boys, four-loom weavers.

Between 1886 and 1906, therefore, the reduction in the proportion of half-timers has caused an advance in average wages per head of 10d. per week, and the changes in the proportion of men, women, lads, and girls full-timers 3d. per week.

It is interesting to trace the effects of the changing proportions

of full-timers over a longer period. The Factory Inspectors' Returns do not show the women over 18 years and girls under that age separately, as a rule, and we are confined to certain periods. Taking the returns for 1835, 1839, 1847, and 1907, and interpolating as above for women and girls in 1862, we get the following (still classifying lads and boys, big-piecers, and four-loom weavers as "men," to bring the Wage Census nearer into harmony with the Factory Inspectors' classification) :—

TABLE 48.—*Full time workers only.*

	Factory Inspectors' Returns.					1906. Wage Census.	
	1835. Percent.	1839. Percent.	1847. Percent.	1862. Percent.	1907. Percent.	Percent.	Wages.
Lads and boys	14·3	16·7	12·6	10·0	8·2	9·9	11·7
Men	30·4	26·1	28·7	28·9	29·2	31·2	28·9
Girls	19·9	23·0	19·3	(19·3)	15·3	13·9	11/-
Women	35·4	34·2	39·4	(42·5)	47·3	45·9	18·8
Wage in 1906 at above propor- tions	19/2	18/4	19/2	19/5	19/10	20/2	—

The Wage Census has, as we have seen, too many adults and not enough boys and girls.

The advance in average earnings of full-timers due to the decreasing employment of boys and girls is 1s. 6d. since 1839, and 8d. since 1835, a change in four years due to the reductions of half-timers and children under 13 years of age which took place in these four years. From 1862 to 1907 the advance from this cause is only 5d.

We thus find that between 1860 and 1906 the average had advanced by 1s. 6d. through the changed proportions of children, young persons, and adults, and that of this advance 5d. is due to changes between young persons and adults, and 1s. 1d. is due to the lessened proportion of children (half-timers).

We can do but very little with the effects of changes in the various occupations owing to want of definite material. The changes from 1886 to 1906, as shown by the Wage Censuses, are illustrated for Lancashire and Cheshire in the table given in the Appendix.

Increment due to improved machinery and greater personal efficiency.

Here we are on more difficult ground. We cannot separate the improvement in the machine from the improvement in the work man. But, after deducting the advances due to definite increases in

wage-rates and to the changes in *personnel*, the residuum of increase is due to the combination of improved machine and greater personal efficiency.

Neither can we trace this movement back very far. We do not know the relative levels of wage-rates before the adoption of the various Standard lists. It is, however, sufficient for all practical purposes to go back to 1860. Between that date and 1906, the average wage of all employed has advanced from 11s. 7d. to 19s. 7d., or by 69 per cent. Of this advance, about 7 per cent. (or 10d.) is due to increased rates of pay, and about 13 per cent. (or 1s. 6d.) is due to the employment of relatively more adults and less children. The remaining 49 per cent. (or 5s. 8d.) is due, therefore, to increased efficiency of operative and machine.

How improved efficiency has been brought about.

It will not be found unprofitable to consider this increase of efficiency as we find it in the various departments of the mill.

Commencing in the cardroom, we find the grinder of to-day practically a skilled operative. On the average he has 14 cards to take care of. The cards are entirely different from those of half-a-century ago; but in a mill where to-day two grinders do the whole of the work, forty to fifty years ago, under the old carding system, about eight or 10 strippers and grinders would have been employed. Here both operative and machine have improved considerably.

In the frames (drawing, slubbing, intermediate, and roving) a large development has taken place, although it is difficult to give exact details. Payment by piece rates has now almost superseded payment by time rates, and the rates are so fixed that an increase in the number of spindles in the frame brings an increased remuneration to the operative, but a less price for producing a given quantity of "drawings" or "roving." The basis of the Oldham list of 1890 and the Universal list of 1907 is given in Section II (*Journal*, February, 1910, pp. 155-156). There are lists in other districts, and the Blackburn "Lists of Prices for Slubbing, Intermediate, and Roving frames, January 6th, 1873, illustrates the advance which has taken place and the method of payment. In slubbing, the standard length is 70 spindles; for every additional five spindles 4 per cent. is to be added, and for every five less spindles 2 per cent. is to be deducted. For the intermediates the standard length is 90 spindles; for every additional five spindles 3 per cent. is to be added, and for every five less spindles $1\frac{1}{2}$ per cent. is to be deducted. In roving the standard

length is 125 spindles; for every five additional spindles 7 per cent. is to be added, and for every five less spindles 1 per cent. is to be deducted. The corresponding lengths of frame under the Oldham and Universal lists are: slubbers, 84 spindles; intermediates, 124 spindles; and rovers, 164 spindles.

Thus, under the Blackburn list, if a slubber with 70 spindles is supposed to earn 16s. 8d., with 75 spindles she would earn 17s. 4d., and with 65 spindles 16s. 4d., and so on.

With such an arrangement there is every inducement to the employer when putting in new machinery to have more spindles to a frame. His labour cost of production decreases, and the operatives earn higher wages. Further, there is always an incentive to greater speed. More work is done by each unit of machine, and the proportion of standing charges, overlooking, &c., is decreased. This inducement has been sufficient to cause a great development in average spindleage. Contemporary writers say very little about the sizes of frames, and I have not been able to trace the growth until recent years. The old "stretcher," which in 1797 did the work of the slubbing and roving frames, had 90 spindles.¹⁴ The differentiation between slubbing and roving brought shorter slubbing frames and longer roving frames, and the added intermediate frame was, as its name indicates, midway between the two. An old-established spinning and manufacturing firm in Lancashire have given me the following particulars of frames which they have put in at various times:—

		Spindles.
Slubbing frames.....	{ 1878	76—90
	{ 1906	96
	{ 1863	92
Intermediates	{ 1883	96—120
	{ 1906	108—126
	{ 1863	120
Roving frames	{ 1890	150
	{ 1906	150—180

At another place the average spindleage of all frames then running, old and new, were:—

	1885.	1906.
	Spindles.	Spindles.
Slubbers	70	89
Intermediates.....	92	102
Rovers.....	109	146

Even if the present usual length of frame is adhered to, the average length will increase for some years, owing to the old short

¹⁴ See part I, *Journal*, January, 1910, p. 57. Notes to Table 3.

ones being taken out when finished with and those of the present normal length being substituted. It is not certain, however, that the maximum length has yet been reached.

An even greater development has probably taken place in the mule. Hargreaves' jenny, 1764, originally had 8 spindles, soon increased to 20 or 30. Crompton's mule invented in 1774 and completed in 1779, combined Hargreaves' jenny and Arkwright's frame of 1769, and started with about 30 spindles. In 1787, "mule jennies" contained about 90 spindles and "hand jennies" about 80 spindles. The mule was rapidly improved after this, and large numbers of spindles were added. In 1788 we find McConnel making mules of 120 and 144 spindles; by 1795 180 is "as few as any we have made this year," and "what was thought best two years ago is now thought too small, as 216 [spindles] now run as light as 144 used to." In 1796 we first hear of two mules being paired, with the gearing in the middle. In 1799 we find mention of 264 spindles in April and 300 in July. This length is, however, probably quite extraordinary as by 1819 the usual length was under 348 spindles.

In 1825 Roberts invented the self-acting mule and by 1830 had very materially improved it. Between 1830 and 1834 we are told by Ure that these mules were put in in 60 mills, containing between 300,000 and 400,000 spindles. The hand mule, however, remained a long time; the self-actor being adopted first for coarse counts and gradually applied to finer counts as improvements were made. It superseded the hand mule very largely in Preston during the strike of 1853, in Oldham between 1866 and 1874, and in Bolton between 1878 and 1886. It is possible that one or two are actually working to-day. There were about a dozen in Bolton four years ago.

The adoption of self-acting, very often by an alteration of the hand-mule, did away with one piecer. This of itself would tend to raise the average earnings per head and increase the average number of spindles per operative.

In 1833 the hand-mule usually had 300 to 400 spindles, and the self-actors 360 to 480. In the "seventies" the average might be put at from 720 to 960; to-day 1,080 is a usual size. The largest known to me are 1,572 spindles, and these (or their predecessors filling the same space) have, singularly enough, been built for over 50 years. Speeds have increased very considerably. In 1830 Ure speaks of 3,800 to 5,000 revolutions of the spindles per minute. To-day the speed is from 8,000 to 9,000. In 1876, when the Oldham spinning list was adopted, the standard number of draws, that is journeys in and out of the carriage which contains

the spindles, was three in 50 seconds, to-day it is three in 42 seconds.

Turning to weaving, we find that an equally wonderful development of efficiency has taken place. The power loom was invented in 1785 and patented in 1787. For many years it came into use but slowly. Gradually improvements were made, and by 1813 it had assumed a form which has been little altered since. From that time to 1830 an enormous number were erected. In 1833 it was still defective, so defective, indeed, that between then and 1882 the improvements made trebled its productive power. The chief of these improvements was the self-acting "temple" or "templet," a rotating contrivance for keeping the woven cloth automatically stretched across the loom, and thereby obviating the necessity of stopping the loom as every few inches were woven to shift the stationary temple, which consisted of a stick with pins in the ends. This moved on as the cloth was wound on the beam ; the automatic temple was a part of the loom, and the cloth passed through it. This invention is said to have made possible the minding of an additional loom per weaver. It is not clear who first invented the automatic temple, but Messrs. Kenworthy and Bullough, of Blackburn, are credited with having produced a loom which "with its self-acting temple, stop, and taking-up motion, reduced the labour of the weaver by nearly one-half."

Apart from changes in piece prices there are two important ways in which weavers' wages may have risen, viz., by increased speed of the loom and by an increased number of looms tended. The speed of the loom, as indicated by the number of picks woven per minute (*i.e.*, the number of times the shuttle passes from one side to another) has increased very greatly. Lord Shaftesbury, speaking in the House of Commons in 1844, stated that the average speed had advanced between 1819 and 1842 from 60 to 140 picks per minute. Ellison quotes, with approval, an estimate by Messrs. Bridges and Holmes in 1873 that the speed in 1833 was 90 to 112 picks per minute, and puts them in 1882 as 170 to 200 picks. The following account was given me by an old weaving overlooker. In 1850, 130 picks, gradually increasing to 160 by the time of the famine, increased sharply after the famine until the "boom" of the "seventies," and then more slowly to 195 in 1882. Another well qualified informant told me that his looms had run at 165 picks in 1864, and 202 in 1906, but that new looms put in since then are running at 212 picks. At a third mill the average in 1875 was 180, and in 1908, 195. Messrs. Bridges and Holmes, in 1873, put the average at 175 or 180 picks. In some parts of Lancashire the speed to-day reaches 240 picks, in weaving coloured

goods, but the looms are somewhat narrower than usual for plain goods. On the whole, the course has probably been: 1833, about 100 picks; 1850, 130 (or more); 1865, 165; 1873, 175; 1885, 180; 1906, 200.

At first nearly all the power loom weavers were women, assisted by children. In 1819, Kennedy, in his "Rise and Progress of the Cotton Trade,"¹⁵ said "it is found that one person cannot attend more than 2 looms." Professor S. J. Chapman says that "for a long time a single operative could not manage more than 1 or 2 looms."¹⁶ Yet we hear of weavers with three or four looms quite early. These almost invariably had a "tenter" or assistant, and I do not think they were very common until the "forties," when the chief improvements in the loom had been made. I repeat the summary made, given in the section on winding, reeling, warping, and weaving for the Manchester district,¹⁷ which further study of the question has confirmed: "From the introduction of the power loom the average weaver had 1 or 2 looms, rising to $2\frac{1}{5}$ by about 1850, increasing slowly to $2\frac{2}{5}$ by 1860, and more rapidly after the cotton famine to $2\frac{4}{5}$ by 1870, and more slowly to $3\frac{1}{5}$ by 1877. By 1886 the average had advanced to 3.3 and by 1906 to 3.44." This, it must be remembered, is the average *per weaver*. The old three- and four-loom weavers had tenters whom they paid out of their gross earnings. Gradually the three-loom weavers did without tenters; then some four-loom weavers, mainly men, followed; to-day quite a large number of four-loom weavers are without tenters, but a six-loom weaver invariably has one. Working without a tenter, of course, usually augments the weaver's net earnings, though not to the full extent of the tenter's wages.

In assisting to bring about this increased efficiency of operative and machine, the Cotton Industry has, in my judgment, been admirably aided by its efficient organisation of employers and operatives, its universal adoption of the principles of Collective Bargaining, its Standard Piece Lists, and its high proportion of piece work. 65.7 per cent. of the cotton operatives work at piece rates, and a further considerable proportion are employed at time rates by piece workers (piecers, reachers-in, weavers' tenters, &c.). These are, for all practical purposes, piece workers. The operatives, therefore, have every inducement to keep pace with faster and better machinery if their price lists are so arranged as to give them the advantage of greater output.

¹⁵ Quoted by Chapman, *The Lancashire Cotton Industry*, 1904, p. 31. I have not traced the original.

¹⁶ Chapman, p. 46.

¹⁷ *Journal*, February, 1910, p. 137.

We have already seen that in frame tenting this is ensured by the addition of a proportionate standard, or rather expected, wage for each additional unit of spindleage. This device is typical of the industry. Its classic example is that of the Oldham Spinning List (1876). I give the main features of this list, which shows how this principle works.

Extract from the Oldham Spinning List, operatives' edition.

No. of dozen spindles.	Total earnings should draw from office	Spinner's wages.	Piecers' wages.
	£ s. d.	s. d.	s. d.
50	2 2 4	27 10	14 6
60	2 9 6	29 6	20 0
70	2 17 2	31 2	26 0
80	2 19 10	32 10	27 0
90	3 3 6	34 6	29 0
100	3 9 2	36 2	33 0
110	3 14 4	37 10	36 6

The wage which should be earned in a week of 56½ hours, allowing for the various necessary stoppages, is stated in the first column. The piece prices are calculated by ascertaining how many hanks of yarn the mules will spin in a week, and dividing it into the amount given in Column 2. The more spindles in the mule, the lower the price, but the higher the average earnings. The inducements to the employer to put in the longest mules for which his mill and work are suited and to the operative to prefer long mules to short ones are obvious. The inducement to keep the machinery in good order is also obvious, when it is understood that the wage must be earned equally on mules 25 years old and on those only just put in. If the old machines will not yield the standard wage at the prices calculated when they are put in, the prices must be advanced. The earnings must not suffer. In other words, the backward employer is penalised for his relative inefficiency.¹⁸ The penalty is often twofold. If he prefers to work with small machines, he pays a higher price per unit of work than does his competitor whose mill is equipped with the large machines. If he does not renew his machinery and enable the output to be maintained he again has to pay a higher price than his competitor whose machines are the newest and best of their size. We hear a great deal occasionally of Trade Union objections to new and improved processes and higher speeds, but the cotton industry has built up its magnificent efficiency largely because its operatives

¹⁸ Compare S. and B. Webb. *Industrial Democracy*, p. 413 of the one-volume edition.

take the opposite view, and not only welcome improvements but penalise all who will not make them. There are many practical difficulties in the way of adopting the cotton trade principles in all industries, but they are slowly gaining a footing in the woollen industry, where the adoption of a "fast" loom for a "slow" one brings a lower piece price, a greater output per unit of time, and a higher earning at the week end. The spinning branches of all textile trades are so much akin to the cotton trade (all spinning is either done on the "mule" or the "frame") that the adoption of piece work with standard lists based on the principle of a lower price but higher wage as the size of the machine increases should be easy of arrangement, and would benefit employer and employed alike.

It is worthy of notice that in the weaving branch of the cotton trade this principle is not in vogue. The price fixed by the Uniform Weaving List applies to all looms of whatever speed, and to weavers with two, three, four, or six looms each. In such circumstances it would be advantageous to the employer to give a weaver as few looms as possible, and to the operative to tend as many as he or she can get. A two-loom weaver earns an average of 6s. 6d. per loom per week, and a three-loom weaver 5s. 11³/₄d. per loom per week, each without an assistant. The four-loom weavers in the Wage Census earn 6s. per loom per week, but many have tenters. Perhaps the average without a tenter will be 5s. 10d.

Subject to the supply of weavers, an employer probably does endeavour to keep the average number of looms per weaver down, and therefore keep his production up. His test is the average per loom all over the shed, and this he always wants to see increasing. Every increase means more work done with the same standing charges. On the other hand, his operatives must earn a sufficient wage to keep them from entering the spinning branches of the trade. Usually each operative has to prove his or her worth on two looms, then three looms, and only the best are promoted to four looms. The inducement to "speed up," however, is still operative. The "tackler," paid on the weavers' earnings, is induced to keep production to the maximum; the employer is induced to "speed up" the looms, and when renewing to put in the fastest his work will stand, by the increased output relative to standing charges.

Although, if a weaver only had one loom, he or she would be paid at the same price as the weaver with four looms, the "standard" weaver is really the three-loom weaver, and the gross average earnings per loom of the four-loom weaver is probably the same as that of the "three-loomer," only part of it going to the tenter. Tenters' wages have usually been very nearly equal to the earnings of one loom, and the higher wages which "doffers" and other assistants earn in the other departments make recruiting of tenters difficult.

Many employers in theory refuse to allow their weavers to take four looms without a tenter; few, in practice, are able to carry this out.

One very interesting feature of the cotton trade is the regularity of the output, despite the great variation in the ability of the operatives. Taking some consecutive weeks at random from an old "average" book relating to a mill which we cannot identify, the average earnings per pair of looms in 1880 were:—11s. 10½d., 12s. 2¼d., 12s., 11s. 10½d., 11s. 9½d., 11s. 8¾d., 11s. 9½d., 12s. 0¼d., 12s., 11s. 11d., 12s. 0½d., 11s. 10½d., 11s. 11¾d. I have even seen them more regular, and not varying by more than 1d. per pair between the highest and lowest of twelve weeks.

A spinning mill not making a wide range of counts will have nearly as regular an output. The following is not an unfair example:—

Total earnings of all employed at a spinning mill in consecutive weeks.

£	s.	d.	£	s.	d.	£	s.	d.
72	13	3	73	1	7	73	11	0
72	18	3	73	11	0	73	1	2

To vary only 18s. on 73l. in six consecutive weeks, or less than 1¼ per cent., is a regularity of which not many industries can boast.

Comparison of cotton with other industries.

It will not be unprofitable to compare the results we have arrived at for the cotton industry with those which are moderately well established for other industries. An examination of the course of wages in various large industries as indicated by the index numbers given in Table 49 reveals the fact that the advance in the wages of cotton factory operatives is only exceeded by that of the Scottish agricultural labourer. From 1850 no industry shows so great a proportionate advance.

I do not think that this excess of advance in the cotton industry is accidental. The outstanding features of the industry are, its extensive collective bargaining, its high proportion of piece work, and its encouragement of higher efficiency both in operative and machine. Operating over at least half a century, these influences have helped to change the cotton industry from an ill-paid, if not badly sweated, industry to a well paid and almost entirely non-parasitic one. A simple and much-needed re-organisation of "piecing" would, indeed, almost rid the industry of "blind alley" occupations. The comparison with the wool and worsted industries, as illustrated by Huddersfield, Leeds, and Bradford, is especially instructive. The progress is fairly continuous at Huddersfield; it is almost arrested at Bradford and Leeds. Trade Unionism is strong

TABLE 49.—*Showing the changes in average wages in various industries, 1800—1903.*
(1900 = 100.)

	1800.	1810.	1820.	1831.	1840.	1850.	1860.	1870-71.	1880.	1886.	1891.	1900.	1906.
Cotton, including hand-loom weavers	} —	71	49	41	47	49	63	—	—	—	—	(100)	—
Cotton, excluding hand-loom weavers	} —	58	57	52	51	51	64	76	81	83	93	100	107
Wool, Huddersfield	—	—	—	57	53	67	82	90	103	92	94	100	109
„ Leeds	85	110	—	(75-80)	86	72	95	100	110	100	—	—	100
Worsted, Bradford	—	—	101	101	—	—	82	104	97	96	96	100	106
Jute	—	—	—	—	—	—	61	76	82	74	96	100	105
Engineering	51	64	65	64	69	67	73	77	82	84	93	100	102
Shipbuilding	47	—	56	60	62	64	68	75	83	83	95	100	99
Building	40	57	57	53	57	58	68	76	87	87	90	100	100
Compositors	72	86	76	76	81	81	81	83	94	94	98	100	102
Coal hewers	—	—	—	—	—	62	71	74	67	67	93	100	90
Puddlers	—	—	—	—	—	66	66	78	81	64	72	100	78
Gas	—	—	—	—	—	67	70	80	87	87	96	100	102
Furniture	—	—	—	—	—	66	71	81	92	91	94	100	100
Agriculture, England and Wales	} 73	93	84	68	72	64	76	84	92	90	93	100	101
Agriculture, Scotland....	34	48	38	32	44	50	60	71	85	87	91	100	103

enough at Huddersfield to make Collective Bargains with the Employers' Associations; there are some recognised Standard Piece Price Lists in operation and, though not to so great a degree as in the cotton industry, *maximum* efficiency is striven for and, in a way, the least efficient employer is penalised. The proportion of piece workers is 54·9 as compared with 65·7 in the cotton industry. In the other districts cited collective bargaining is in its infancy; there are no Standard Piece Price Lists, and the low proportion of 128·1 per cent. of piece workers is found at Bradford, and of 33·8 per cent. at Leeds. I do not suggest that a high proportion of piece workers and high and rising wages always accompany each other, but in those occupations where, as in combing, spinning, winding, warping, and weaving, there are routine processes similar in each mill or factory, a high proportion of piece work done under standard conditions is the safest guide to progress.

Summary and conclusion.

We have seen that the device of the index number enables us to arrive at substantial conclusions, in spite of the apparent inconsistencies and contradictions in the raw material of our inquiry. In the early days of the cotton industry an enormous range of earnings prevailed, and the industry was greatly dependent on child-labour. Continuous adaptation to new methods, extensive collective bargaining, an ever-widening area of standardised conditions, and a conscious adoption of the principles of mutual inducements to both employer and operative to increase the efficiency of person and machine, and of penalising the backward, inefficient employer by relatively increased costs of production, have brought about an increase of wages unequalled over sixty years in any other industry. We have been able, in some instances, to analyse the advance due to the decreased employment of children, the advance of piece prices paid, and the increase in personal and mechanical efficiency, and have found that, even if the old proportion of child-labour had still prevailed, and the piece prices of 1860 had remained unimproved upon, a very considerable advance in average earnings would have accrued. With all this the hours of labour have been reduced considerably.

We have not seen any evidence that these progressive forces have ceased to be operative, or that there is any need to be apprehensive of a decline. The progress in the cotton trade is a marvellous example of the results of close and persistent organisation, which should be copied by many other industries, if they would maintain and increase their efficiency.

ERRATUM.—Part XV, Section I, Table 4. Throstle and ring spinners, 1839. *For 7/- read 8/-.*

APPENDIX.

Table showing the percentage employed and average wages of various classes of cotton operatives in LANCASHIRE and CHESHIRE in 1886 and 1906.

Occupation.	1886.				1906.		
	Time or piece.	Number.	Per cent.	Average wage.	Number.	Per cent.	Average wage.
MEN.							
Foremen:—							
Preparing	T	746	0·6	32/2	754	0·4	39/0
„	P	16	—	28/10	34	—	43/9
„	T & P	762	0·6	32/1	788	0·4	39/2
Spinning	T	611	0·5	32/1	581	0·3	41/11
„	P	6	—	24/3	39	—	45/0
„	T & P	617	0·5	32/0	620	0·3	42/11
Weaving	T	167	0·1	31/9	625	0·3	38/7
„	P	1,151	0·9	36/9	2,303	1·3	43/9
„	T & P	1,318	1·0	36/1	2,928	1·6	42/8
Others	T	180	0·1	37/5	692	0·4	34/5
„	P	6	—	22/1	28	—	37/4
„	T & P	186	0·1	36/11	720	0·4	34/6
Mixers	T	558	0·4	17/2	582	0·3	21/7
Scutchers	T	744	0·6	18/9	760	0·4	25/9
„	P	16	—	29/4	—	—	—
„	T & P	760	0·6	18/10	760+	0·4	—
Grinders	T	1,942	1·5	20/4	1,557	0·8	29/5
„	P	41	—	20/4	—	—	—
„	T & P	1,983	1·5	20/4	1,557+	0·8	—
Spinners—							
Counts below 40's ..	P	—	—	—	4,798	2·5	38/10
„ 40's to 80's ..	P	—	—	—	3,943	2·1	43/0
„ above 80's ..	P	—	—	—	1,269	0·7	46/0
All counts.....	P	6,951	5·3	31/3	10,010	5·3	41/5

Note re Percentages.—The percentages in this table are calculated to the nearest decimal place, and slight discrepancies occur owing to “throwing up” the excess of '05 to the nearest '1.

Table showing percentage employed and average wages.

Occupation.	1886.				1906.		
	Time or piece.	Number.	Per cent.	Average wage.	Number.	Per cent.	Average wage.
<i>MEN—contd.</i>							
Big piecers (M and B)	T	5,690	4.3	14/1	8,851	4.7	17/9
" "	P	212	0.2	14/10	164	0.1	19/10
" "	T & P	5,902	4.5	14/1	9,015	4.8	17/10
Twiners.....	P	101	—	33/8	125	0.1	42/1
Ball warpers.....	T	—	—	—	33	—	30/7
" "	P	25	—	38/0	216	0.1	42/0
" "	T & P	25	—	38/0	249	0.1	40/6
Sizers, &c.....	T	332	0.3	32/10	426	0.2	43/0
" "	P	265	0.2	38/2	131	0.1	46/2
" "	T & P	597	0.5	35/2	557	0.3	43/9
Warp dressers.....	P	—	—	—	675	0.4	37/1
Twisters-in.....	T	14	—	21/0	33	—	25/4
" "	P	851	0.6	20/3	1 166	0.6	25/7
" "	T & P	865	0.6	20/3	1,199	0.6	25/7
Drawers-in.....	T	9	—	23/6	—	—	—
" "	P	366	0.3	24/10	300	0.2	30/9
" "	T & P	375	0.3	24/10	300+	0.2	—
Weavers, 2 looms.....	P	239	0.2	15/11	661	0.4	21/8
" 3 ".....	P	1,284	1.0	16/6	1,433	0.8	19/6
" 4 ".....	P	6,257	4.7	20/10	11,367	6.1	25/1
" 6 ".....	P	767	0.6	26/7	1,825	1.0	32/11
" All*.....	P	8,577	6.5	20/7	15,286	8.1	25/4
Fustian weavers, 2 looms	P	12	—	12/0	—	—	—
" " 3 "	P	73	—	16/6	—	—	—
" " 4 "	P	206	0.2	19/10	69	—	21/8
" All.....	P	291	0.2	18/8	69+	—	21/8
Warehousemen.....	T	1,404	1.1	22/4	2,585	1.4	24/1
" "	P	182	0.1	21/2	889	0.5	28/11
" "	T & P	1,586	1.2	22/2	3,474	1.9	25/4
Mechanics.....	T	669	0.5	31/2	607	0.3	34/1

* Including a few on 1 and 5 looms respectively in 1886.

Table showing percentage employed and average wages.

Occupation.	1886.				1906.		
	Time or piece.	Number.	Per cent.	Average wage.	Number.	Per cent.	Average wage.
MEN—contd.							
Enginemmen	T	909	0·7	25/3	1,260	0·7	31/3
„	P	—	—	—	23	—	35/8
„	T & P	909	0·7	25/3	1,283	0·7	31/4
Labourers	T	208	0·1	18/7	1,369	0·7	20/2
Other men	T	2,619	2·0	20/1	2,917	1·6	23/2
„	P	347	0·3	28/7	590	0·3	29/1
„	T & P	2,966	2·3	21/1	3,507	1·9	24/2
TOTAL MEN	T & P	36,206	27·5	23/3	56,180	30·0	27/3
LADS AND BOYS.							
Little piecers	T	4,226	3·2	9/9	8,211	4·4	12/0
„ „	P	—	—	—	72	—	11/7
„ „	T & P	4,226	3·2	9/9	8,283	4·4	12/0
Weavers, 2 looms.....	P	1,471	1·1	10/9	1,685	0·9	12/5
„ 3 „	P	689	0·5	15/2	1,310	0·7	17/11
„ 4 „	P	41	—	19/3	668	0·4	24/1
„ All	P	2,201	1·7	12/3	3,663	1·9	16/6
Other lads and boys	T	4,416	3·3	8/4	5,387	2·9	9/4
„ „	P	233	0·2	11/4	196	0·1	13/8
„ „	T & P	4,649	3·5	8/6	5,583	3·0	9/6
Half-timers	T	5,169	3·9	3/0	3,006	1·6	3/7
TOTAL LADS AND BOYS	T & P	16,245	12·3	7/7	20,535	10·9	10/11
WOMEN.							
Draw-frame tenters.....	T	547	0·4	12/11	379	0·2	16/9
„ „	P	1,847	1·4	15/4	2,294	1·3	20/7
„ „	T & P	2,394	1·8	14/9	2,673	1·4	20/0
Slubbing „	T	—	—	—	116	0·1	16/2
„ „	P	—	—	—	1,706	0·9	19/11
„ „	T & P	—	—	—	1,822	1·0	19/8
Intermediate „	T	—	—	—	88	0·0	15/1
„ „	P	—	—	—	2,113	1·1	19/5
„ „	T & P	—	—	—	2,201	1·2	19/4

Table showing percentage employed and average wages.

Occupation.	1886.				1906.		
	Time or piece.	Number.	Per cent.	Average wage.	Number.	Per cent.	Average wage.
WOMEN—contd.							
Roving	T	—	—	—	123	0·1	18/9
„ „	P	—	—	—	6,294	3·4	19/3
„ „	T & P	—	—	—	6,417	3·4	19/3
Frame tenters unclassified	P	—	—	—	526	0·3	21/5
Slubbing, intermediate, roving, and unclassified tenters	T	733	0·5	14/5	327	0·2	16/10
„ „	P	7,658	5·8	15/5	10,639	5·7	19/5
„ „	T & P	8,301	6·3	15/4	10,966	5·9	19/5
Ring spinners	T	1,669	1·3	12/0	3,130	1·7	15/2
„ „	P	488	0·3	14/0	871	0·5	16/11
„ „	T & P	2,157	1·6	12/6	4,001	2·1	15/7
Reelers and winders	T	390	0·3	13/2	333	0·3	13/6
„ „	P	10,139	7·7	13/0	13,063	7·0	15/2
„ „	T & P	10,529	8·0	13/0	13,406	7·1	15/2
Doublers	T	441	0·3	12/0	590	0·3	13/10
„ „	P	218	0·2	11/7	169	0·1	14/9
„ „	T & P	659	0·5	11/10	759	0·4	14/0
Beam warpers	T	42	—	15/4	314	0·2	18/0
„ „	P	1,241	0·9	18/3	1,545	0·8	21/8
„ „	T & P	1,283	1·0	18/2	1,859	1·0	21/1
Weavers, 1 loom	P	152	0·1	12/6	—	—	—
„ 2 „	P	3,953	3·0	11/8	3,050	1·6	13/11
„ 3 „	P	10,142	17·7	16/1	15,213	8·1	17/9
„ 4 „	P	13,546	10·3	19/11	24,803	13·2	23/6
„ 6 „	P	196	0·2	26/3	168	0·1	30/7
„ All	P	27,989	21·3	17/4	43,234	23·1	20/10
Fustian weavers, 2 looms	P	298	0·3	11/6	127	0·1	12/11
„ „ 3 „	P	1,123	0·8	17/1	637	0·3	18/4
„ „ 4 „	P	528	0·4	18/10	211	0·1	20/10
„ „ All ...	P	1,949	1·5	16/8	975	0·5	18/2

Table showing percentage employed and average wages.

Occupation.	1886.				1906.		
	Time or piece.	Number.	Per cent.	Average wage.	Number.	Per cent.	Average wage.
WOMEN—<i>contd.</i>							
Other women	P	1,446	1·1	11/11	2,597	1·4	13/4
" " 	P	1,102	0·8	13/8	1,522	0·8	16/5
" " 	T & P	2,548	1·9	12/8	4,119	2·2	14/6
ALL WOMEN	T & P	57,809	44·0	15/9	81,992	43·8	19/0
GIRLS.							
Reelers and winders ...	T & P	1,010	0·8	9/4	2,164	1·1	11/0
Weavers, 1 loom	P	46	—	5/4	—	—	—
" 2 " 	P	4,024	3·1	10/5	6,066	3·2	11/9
" 3 " 	P	1,043	0·8	15/8	3,163	1·7	17/4
" 4 " 	P	42	—	19/4	722	0·4	22/2
" All	P	5,155	3·9	11/6	9,951	5·3	14/3
Fustian weavers, 2 looms	P	—	—	—	84	—	12/1
" " 3 " 	P	—	—	—	90	—	17/10
" " All	P	34	—	8/1	174	0·1	15/1
Other girls, full time	T	6,921	5·3	7/1	11,795	6·3	8/5
" " 	P	867	0·6	8/6	1,305	0·7	10/5
" " 	T & P	7,788	5·9	7/3	13,100	7·0	8/7
Half-timers	T*	7,333	5·6	2/7	3,222	1·7	3/0
ALL GIRLS	T & P	21,320	16·2	6/10	28,611	15·3	10/2
ALL EMPLOYED ...	T & P	131,580	100·0	15/4	187,318	100·0	19/7

* A very few worked by piece-work in 1906.

This table has not been included in the main body of the paper because, owing to the unfortunate method of the Board of Trade in making the groups of "other" men, women, lads and boys, and girls so large. For example, as we do not know how many of the 4,649 "other lads and boys" are piecers, weavers' assistants, ring doffers, reachers-in, &c., we cannot definitely tell what departments have grown most proportionately between 1886 and 1906.

The changes in the relative proportions of men, &c., have been :—

	1886.	1906.
Men.....	27.5	30.0
Lads and boys, full time	8.4	9.3
" half time	3.9	1.6
Women	44.0	43.8
Girls, full time	10.6	13.6
" half time	5.6	1.7
	100.0	100.0

These changes are not very significant, except for the reduction of half-timers, who have been partly replaced by full-time boys and girls. The growth of men relatively to women may also be significant, as it is mainly to be found in weaving.

Foremen have increased from 2.2 per cent. to 2.7 per cent., but the men in mixing, scutching, and cardrooms have declined from 2.5 per cent. to 1.5 per cent.

The figures for spinning are interesting, thus:—

	1886.	1906.
Men spinners	5.3	5.3
" piecers	4.5	4.8
Lads and boys, piecers	3.2	4.4
Total recorded in male spinning	13.0	14.5
Assume, half of half-time lads and boys as piecers	2.8	0.8
Total estimated male spinning	15.8	15.3
Ring spinning, women	1.6	2.1
Total recorded in spinning	17.4	17.4

A slight re-arrangement of proportions has left the total percentage shown in spinning unchanged. The inclusion of ring-frame doffers (girls and boys) would probably add a little to the 1906 percentage.

Frame-tenters (*women*) have increased from 8.1 per cent. to 13.2 per cent., indicating that the improvements in machinery have been greater in spinning and the earlier preparation than the frames and looms.

Weavers have also increased in proportion.

In 1886 and 1906 these were distributed thus:—

	1886.	1906.
	Per cent.	Per cent.
Weavers, men	6·7	8·1
" lads and boys	1·7	1·9
" women.....	22·8	23·6
" girls.....	3·9	5·4
	35·1	39·0

All have increased, but the increase in men weavers is significant of the high average earnings of four- and six-loom weavers.

The other groups do not call for any remark.

DISCUSSION *on* MR. WOOD'S PAPER.

THE PRESIDENT said the Paper, like all Mr. Wood's work, contained a great deal of valuable information ; and, as usual in wage-statistics, a considerable portion of his labour had to be spent in filling up gaps by inference, owing to the lack of definite information. Fortunately, there were present gentlemen who were perfectly competent to deal with that aspect of the matter ; and he asked Mr. Bowley, who was a master of statistical hypothesis, to move the vote of thanks.

MR. A. L. BOWLEY, in moving a vote of thanks, said the actual Paper gave but little indication of the amount of work which had been done to produce the results. It was now eleven years since Mr. Wood put into his hands his draft estimate of the changes of wages in Manchester, and he had already carried the matter very much farther than any previous investigator had been able to take it ; and, so far as he knew, that subject had never been absent from his mind since that time. This Paper followed nearly 100 pages of tabulated matter in the last four issues of the *Journal*, from a study of which it would be apparent that a great amount of detail was necessary for compiling the wages of such an industry, even when it was as concentrated as the cotton industry was. Inspection of the details of those preliminary sections would show what an immense amount of technical and local knowledge was needed to piece together the information obtained from different districts, and to trace the course of wages in different occupations. On first taking up the question of the statistics of wages in the cotton trade, one's impression was one of simple chaos ; the various lists gave no guide as to hours ; the rates varied from place to place, and the minute grades of occupation also varied from place to place. The quotations obtained from almost any one of the large numbers of

authorities who dealt with this subject were often badly localised, vague in extent, and difficult to fit in with any reasoned scheme. The main work of the Paper, apart from the mechanical tabulation, had been to fit together all those scattered estimates, to find out the presence of apparent inconsistencies, to discover the truth among those various inquiries, and to reject all figures which could not be properly supported. All that required a very considerable knowledge of the trade and of the district. It had been his privilege to be with Mr. Wood in Lancashire, and to see the actual way in which he had obtained first-hand information. There was behind it a large amount of knowledge based on weavers' averages and on the records of mills where particulars were kept. The mere accumulation of figures and their tabulation was a great piece of work, but not always praiseworthy; sometimes it was a hindrance to carrying on a real statistical investigation; and, therefore, he would call attention especially to the way in which the author considered the possibilities of error, tested them in case after case, and traced the effect of the possible errors through to their result. Having had some experience of dealing with this kind of weighted averages, he was astonished to find how very little difference those errors in detail had in the final page, which gave the index number. Again, in dealing with cotton and other wages, it was not enough to perceive and record all the changes: one had also to find out, if possible, the causes and nature of the circumstances in order to know whether a change was genuine. Mr. Wood had been singularly successful in finding out why and when wages changed, and particularly in analysing the effect of the different events which might have been expected to cause those changes. When one put together the kind of detail on which the Paper was based, and began to piece it together and find the averages, it became evident that the figures were not mere chance, random manifestations, but were closely related together, and the final average grew under one's eye; the whole structure attained a kind of organic life, and it became absolutely certain that the true result was very near the one which was being evolved. After that stage was once reached, where new information or small uncertainties began to have very little effect on the final line shown, then certainty began to take the place of assumption. It was quite evident, from even a casual reading of the Paper, that that phenomenon had been present among these statistics; and, therefore, the result might be depended on with very much more confidence than those who had not worked in this kind of material would believe. They were not altogether dependent, however, on such a phenomenon. There were very important inquiries and returns of 1833, 1886, and 1906, which made it possible to contrast at these widely different dates the net result of all those changes. He had looked as far as he could into the means by which that could be done; and he did not find any flaw in the method. He was afraid they would have to take a very great deal of the work for granted; but he had looked carefully into some of the weighted averages, assigning the various proportions to different centres, and he had no criticism of any kind to make on

the method or the result. Quite recently he had occasion to examine closely cotton wages during the last twenty years, and he had made an index number from 1880 to 1906. In so doing, he had had to reject some part of the work which he did for a Paper in 1895, dealing with wages; and he found that the figures in his earlier Papers from 1860 to 1883, pieced together with the new results from 1880 to 1906, agreed with remarkable closeness with Mr. Wood's figures. He mentioned that to lend as much support as he could to the line of statistics since 1861. If his estimate had differed from them, however, he should have withdrawn it in favour of Mr. Wood's, but as it was he was glad to think the rather rapid selection he made fifteen years ago had been supported by this new series of numbers. One of the great difficulties in the Paper was the combination of the cotton industry before it was a full factory industry with the cotton industry as it was known to-day. He was glad Mr. Wood had proceeded with so much caution on this point, because it was evident that certainty could not be arrived at. He was surprised he could get so much support for his estimates as he had incidentally obtained; he could not obtain accuracy (which, in fact, was hardly conceivable), for it was comparing two unlike things together. The operatives in 1806 were handling cotton, and the factory workers to-day were handling cotton; but at that point the resemblance ceased. It was very interesting to see how the figures ran together, but their combination was not of very great importance; and, therefore, he did not regret so much as he otherwise would have done the uncertainty that arose from the welding together of the two classes of figures. He would be glad, however, if the foot-note as to winders, &c., in 1800 were brought more into the forefront before the Paper was published, to show that it was an important qualification of the main table. At present, it was not unlikely that the main table would be quoted as referring to handloom workers and factory weavers, leaving out all other operatives. That would modify the general impression given by the Paper in the right direction, and was worth more than a foot-note. He was rather sorry that the author had not brought the question of half-timers more to the front, for they must not lose sight of the fact that a large percentage of cotton operatives, especially in the latter part of the last century, were only working half-time, and could hardly be counted as full persons in a divisor which gave the average. That was dealt with, but not exactly in the place he should have expected to see it. A glance at the results of the Paper, as compared with the changes in piece lists, showed that the changes in piece lists had no definite relation to changes in earnings. A rise in piece lists might be connected with a fall in earnings. The same was true, although it did not operate so much in the cotton trade, in regard to changes in time rates. Changes in standard time rates and piece rates did not enable one to place the change in average earnings. It was necessary to take the industry as a whole, and to watch for all the causes besides nominal changes in rates before one could make any statement which could be depended on in regard to changes in earnings. With regard to the

last table, it was true that the cotton trade had increased in earnings more rapidly than any other trade ; and it was interesting to notice the line of cotton wages beside that of the building trade wages, as they knew that the two trades were very different in their history ; building was still done much as it was done 100 years ago—what few changes there had been had been recent. But cotton was a different industry absolutely. In the one case we had mainly time rates, and in the other mainly piece rates. If one drew the two lines together and compared them, it would be found that the resemblance was remarkably close, both as a whole and in detail. The Paper was an extraordinarily valuable one, and it carried forward the method of dealing with wage statistics yet another stage.

Mr. A. W. FLUX, in seconding the vote of thanks, said he regretted he had not had an opportunity of studying the Paper previously, so that he could hardly speak with any certainty about some points which had been raised. Mr. Bowley had already called attention to the obvious fact that the preparation of a Paper of this character involved an enormous amount of detailed labour. He was struck by the extent to which the estimates by various authorities cited in the Paper did in an extremely remarkable way confirm one another. If one could have had the opportunity of seeing those estimates grow under one's eye, in the way to which Mr. Bowley had referred, he had very little doubt that the sense of conviction that they represented as nearly as possible the fact would have been far more marked than it could be on first hearing the Paper read. He was tempted to ask a question which was suggested by the instructive diagram accompanying the Paper. At the beginning and at the end of the nineteenth century it appeared that the general average of wages of all operatives in the cotton industry had substantially the same level, which was a very remarkable fact. The proportion of children in the industry was substantially higher at the earlier date, and that would lead to the conclusion that the figures presented failed to represent fully the high level of adult wages at the beginning of the nineteenth century. Had any adjustment of the figures been made to allow for the changed proportion of children ? It might be that the answer was in the part of the Paper which the author had not been able to read, but it did not appear to be in the part actually read. Another point was one on which the Chairman remarked—the use of hypothesis. On p. 588 they were told that, if what happened on the average in certain Lancashire centres happened also at Preston, Blackburn, and Clitheroe, the average for those places would be rather less in 1840-42 than in 1833. Did that mean that the figures in the preceding table, representing Preston and Blackburn in 1842, were interpolated on the basis of figures from elsewhere ?

Mr. WOOD said Mr. Flux had misunderstood him. The figures for 1840 and 1841 for Preston and Blackburn were correct ; and the details were given in previous issues of the *Journal*. They did not

know exactly what happened in 1833 in Preston, and no figure was given. He had to assume that something happened; and he assumed that what happened at Clitheroe, where they had information, happened also at Blackburn and Preston.

Mr. FLUX said he was glad to have elicited that explanation, which removed the doubt which arose in his mind from not having had an opportunity of bringing the four valuable articles in the *Journal* and this Paper together. On p. 608 reference was made to the reduction of hours and the effect of that on wages; and the suggestion was that after the hours were reduced there was a speeding-up of machinery. He did not wish to say anything very definite one way or the other, but it might be asked whether perhaps the reduction of hours was not itself the necessary consequence of speeding-up, with its resultant strain on the workers. How far that might modify some of the general conclusions, he was not prepared to say. There was another point. While he was personally in sympathy with the author as to the conclusion he drew, namely, that organisation had tended to raise wages in the cotton industry, still, looking at the matter as a critic, it occurred to him that the author was finding in the figures to some extent what he desired to find. One might be permitted to suggest that there was another point of view, and that a leisurely study of the figures might possibly fail to show that they bore out absolutely the suggestions which were put forward. It was very difficult to summarise a Paper of that length apart from the detailed evidence; and it was therefore necessary to defer definite judgment pending a detailed study of that evidence. He had great pleasure in seconding the vote of thanks.

Miss B. L. HUTCHINS asked whether Mr. Wood had come across any evidence as to the effect of speeding-up on the energy and health of the operatives. A great deal of attention had been given to that in a recent book from America. She thought it ought to be remembered that increased efficiency of machinery might tend to economic or technical progress, and yet involve a decrease in social efficiency if the nervous strain were too great.

Mr. S. ROSENBAUM asked if there were anywhere in the Paper a statement showing what was the average wages of adult workers only, distinguishing also males and females, at different times in the century; and, if not, whether such information was available. He thought that had a very important bearing on the question under discussion.

Mr. G. UDNY YULE said he greatly appreciated the immense amount of labour which had gone to the collection of the data for the Paper.

The PRESIDENT said the question was one on which so much special knowledge was required that he could only deal, as an

outsider, with one or two points which had struck him during the reading of the Paper. The speeding-up of machinery, for instance, was conducive, no doubt, to the greater efficiency and to the higher wages of the operative; but did it not tend to curtail the effective period of the worker's life? Some fourteen or fifteen years ago he had read a report in which the speed at which factory machinery was run in the United States (which was not so high as that mentioned in the Paper) was alleged to result in the incapacity of the worker for that class of work after the age of 40 or 45. He remembered Mr. John Burns saying that at the pay-desk of an American factory he had seen "not a grey hair on the head, nor a smile on the face." That could hardly be called an advantage, especially if in middle life the earning power fell off seriously. Another point to which he would refer, again with some diffidence, was the comparability of the rate of wages at different periods, when the coinage was known to have had very different purchasing power; as, for instance, in 1806 and 1816, and again shortly after 1851. That seemed to him a factor which might well be correlated with the other interesting facts brought together in the Paper. The author, again, had abstained, perhaps wisely, from correlating the four main influences upon wages which he mentioned. It might not be possible so to treat them, but it appeared to him that the successive positions of the cotton wage-earnings could not be definitely appraised unless such factors received their respective values in the estimate.

Mr. WOOD, in reply, said that in regard to the President's question he might observe that it was no part of his work at present to attempt to turn the nominal or money wages into terms of real wages; but for every year since 1850 to 1903 that had been already done by him in the *Journal* last year, and it had been attempted once or twice before. His first attempt at doing it was at the British Association in 1899. The two things had to be done separately; one had to state the course of prices and of wages quite independently. They were two different problems altogether. Mr. Bowley had offered no criticism which required a reply, except that he had not dealt with half-timers exactly as he (Mr. Bowley) had wished. Mr. Bowley was thinking of two half-timers being worth one full-timer, and suggesting that he might possibly have made that estimation. He had eliminated the half-timer altogether for certain purposes; and he did not agree with Mr. Bowley's view of the function of a half-timer at all. He had had reason to criticise the suggestion, which he had known put forward, that two half-timers were worth one full-timer. As a matter of fact, they were much more frequently accustomed to find a half-timer working, *e.g.*, as a weaver's tenter, and the weaver doing without the tenter altogether during that part of the day in which the tenter was at school. The half-timer was an individual, and not half an individual only. Mr. Flux had raised a point which was absolutely explained in the Paper; and the explanation itself became self-evident when the Paper was read closely. Beginning in the year 1833, every

child in the industry was counted in, because a complete census had been taken in that year. He had to estimate, between 1806 and 1833, that there were practically no changes in the relative numbers of men, women, and children employed; they did not know which way the change went.

Mr. FLUX asked if the conclusions held up that the relative wages of adults in 1806 and 1906 would represent even less progress than was shown.

Mr. WOOD said that question rather assumed the mixing of the hand-loom weaver with the factory operative. The wages of the factory operative had been already given in previous sections of the *Journal*; and, looking at the diagram, it would be seen that the dotted line (representing factory workers) was by no means as high in 1806 as in 1890. The high wages were the wages of hand-loom weavers; the low wages were the wages of factory operatives, who were much in the minority. The high resultant average wages of all employed were due to the fact that the hand-loom weavers were earning about 1*l.* a week, while the factory operatives were earning about 10*s.*, and that there were so many more hand-loom weavers than factory operatives. It would be correct to say that all adults in the cotton industry in 1806 earned more wages on the average than all the adults in 1890; but that was because the cotton industry outside the factory branches was largely dependent on adults. With regard to the question of the effect of hours on efficiency, right through the plea of the advocates of the legal curtailment of hours had been that the strain of the machine was so great that the reduction of hours had been necessary for the sake of the women and children. It was said that "the men hid themselves behind the women's petticoats" in asking for the Ten Hours' Act and subsequent reductions; but he did not know if that was always substantiated. He might say that his conclusion was based on unique experience. The details given him as to speeds, length of spindles, &c., were actually taken out from old records, some of which were mouldy and were found in safes and in lofts; one of the most valuable records he had found in an old stable. He had seen much more evidence, and evidence which he could not use here, because it did not belong to him, but which would support his conclusion, namely, that immediately hours were reduced it was found possible to speed up the different machines and get closer attention from the operatives; but beyond that, when new machines were put in, again further improvement was made, and it was able to run at a still faster rate. The speeding-up of the machinery in the cotton trade had been gradual and automatic; it probably advanced 1 per cent. per annum cumulatively from 1833. Schulze-Gävernitz had rightly said that a hand-loom weaver had worked 70 to 80 hours a week, but that it would be impossible to let a modern four-loom weaver work such hours. His impression was that the old weavers could not have been trained to work the present machinery at all. It was a new race of operatives and a new set of machines. In answer

to Miss Hutchins, he did not think there had been any effect on the operative ; the thing had been too gradual to affect the health of the operative. His personal opinion, though he must say he had not very much evidence on that point, was that the improvement in the machine, as well as in the operative, had not had any effect on the health of the operative. With regard to the organisation, he must say the evidence as to the value of it in the cotton trade was overwhelming. One could not have without organisation that particular type of standard piece price list which induced the employer to put in newer and better machinery, and induced the operative to work that machinery. He spoke with some considerable knowledge on this point. The value to Lancashire of organisation had been so great that he remembered Mr. Macara saying to him two or three years ago that if the people of Lancashire knew and valued Mr. James Maudesley as he did, they would put up a statue to his memory. The employers in Lancashire had no doubt as to the value of organisation on both sides and of collective bargaining. Mr. Rosenbaum would find in Table 42 the evidence he wished as to the changes in wages of adults ; and in Table 48 his estimate as to the changes in wages, not of adults, but of full-timers. He did not think it was possible entirely to separate the adults.

The following candidates were elected Fellows of the Society :—

J. Ellis Barker.

Ernest D. T. E. Breul.

Walter Peacock.

MISCELLANEA

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I.—*Notes on the Distribution of Estates in France and the United Kingdom.* By H. C. STRUTT.

A RECENT publication by M. J. Séailles, in which particulars are given of the values and numbers of estates passing by deaths in France during the years 1903-04-05 and 1907, and classified according to the size of the estate, enables us to compare the distribution of estates in France with that in this country, the details of the latter being published in the yearly reports of the Commissioners of Inland Revenue.

The two sets of tables, as they stand, are not immediately comparable, as the *minimum* value of estates recorded in the French statistics is 1 franc, while the estates included in the Inland Revenue reports do not extend to those below 101*l*. By a rough calculation, however, the number and aggregate value of the French estates between 1 and 2,500 francs may be ascertained with sufficient accuracy for the purpose in hand, so that upon the removal of the figure so obtained from the French statistics, the figures for both countries can be made to cover the same range of values. The results are as follows:—

TABLE 1.—*Classification of the numbers of successions and the aggregate amounts according to categories of value. The figures are the arithmetical means of those relating to the years 1903-04-05 and 1907.*

FRANCE.

Class.		Number in each class.	Percentage of total number.	Amount in each class.	Percentage of total amount.
£	£			£	
100 to	400	89,877	60·50	19,365,981	9·40
400 „	2,000	43,978	29·60	37,496,041	18·20
2,000 „	4,000	7,194	4·84	20,010,126	9·72
4,000 „	10,000	4,632	3·12	28,856,271	14·00
10,000 „	20,000	1,601	1·08	22,587,889	10·96
20,000 „	40,000	765	·51	21,353,912	10·36
40,000 „	80,000	338	·23	19,096,000	9·27
80,000 „	200,000	131	·09	15,438,872	7·49
200,000 „	400,000	29	·02	8,325,896	4·04
400,000 „	2,000,000	9·25	·01	6,781,249	3·29
Above 2,000,000		1·75	—	6,747,329	3·27
		148,556	100·00	206,059,566	100·00

Classification of the numbers and aggregate amounts of estates according to categories of value. The figures are the arithmetical means of those relating to the years 1904-05-06 and 1907.

UNITED KINGDOM.

Class.		Number in each class.	Percentage of total number.	Amount in each class.	Percentage of total amount.
Exceeding £	Not exceeding £			£	
100 and	500 ...	33,961·75	52·17	9,947,533	3·56
500 „	1,000....	10,322·50	15·86	8,554,683	3·06
1,000 „	10,000....	16,822	25·84	61,550,267	22·02
10,000 „	25,000....	2,340·75	3·60	41,252,609	14·76
25,000 „	50,000....	907·75	1·40	35,363,725	12·65
50,000 „	75,000....	289·25	·44	19,437,164	6·96
75,000 „	100,000....	142·75	·22	13,093,382	4·69
100,000 „	150,000....	132·25	·20	16,949,404	6·06
150,000 „	250,000....	93·50	·14	20,324,934	7·27
250,000 „	500,000....	55·75	·09	20,718,998	7·41
500,000 „	1,000,000 ..	19·75	·03	14,963,037	5·35
Exceeding	1,000,000 ...	6·50	·01	17,351,706	6·21
		65,094·50	100·00	279,507,622	100·00

A study of these figures reveals the fact that in both countries the inequality of distribution is very great.

In France we find at the beginning of the series, by referring to the class between 100*l.* and 400*l.*, that three-fifths of the total number of *propriétaires* who died left an aggregate property of less than one-tenth of the total passing, while the small number of 40 persons in the last three classes, forming practically a negligible fraction of the total, were possessed of a much larger aggregate amount. In England the inequality is still more striking, for the aggregate value of more than half the number of estates amounts to 3½ per cent. only of the total property passing, while 26 persons at the end of the series left nearly 12 per cent. of that total. Not to labour the point, the figures reveal conclusively that among estate owners themselves great inequality prevails in France, and much greater in the United Kingdom.

If we now bring these figures into comparison with the population of the two countries, the greater diffusion of property in France is shown in the most unmistakable manner. The population of the United Kingdom for the years under consideration may be roughly stated as 43,000,000, and that of France, as given by M. Séailles, as 38,000,000; nevertheless, we find that about 150,000 persons possessing property of at least 100*l.* die in the course of the year in France, as compared with 65,000 only in the United Kingdom. When, however, we consider the property involved we find that the 65,000 persons in this country possessed an aggregate of property amounting to 280,000,000*l.* against 206,000,000*l.* owned by nearly two and a half times the number in France.

A more complex matter, but one of great practical interest to statisticians, is the comparison of the multipliers for France and

England, the "multiplier" being defined as a figure by which the total amount of property left by deceased persons in a given year and country should be multiplied to obtain the total property in the hands of the living.

This problem is the more interesting as so many widely different figures have been proposed by statisticians at various times. The latest figure for England, advocated by Mr. Bernard Mallet in his Paper read before the Royal Statistical Society on 18th February, 1908, was 24; and as this was supported by carefully compiled statistical data it seems probable that this figure will hold its ground as far as this country is concerned.

TABLE 2.—*Numbers. Table showing under the several categories of age the number of living persons possessing estates (column 5), as inferred from the number of deceased persons leaving estates, the total number of deceased persons, and the living population.*

Categories of age.	1 Mortality. (Number of deaths in the year.)	2 Population. (Number of living persons).	3 Quotient. $\left(\frac{n_x}{m_x}\right)$	4 Number of persons who died in the year leaving estates. (p_x)	5 Number of living persons possessing estates. $\left(\frac{p_x n_x}{m_x}\right)$	6 Ratio of column 4 to column 1. $\left(\frac{p_x}{m_x}\right)$
(x)	(m _x)	(n _x)	$\left(\frac{n_x}{m_x}\right)$	(p _x)	$\left(\frac{p_x n_x}{m_x}\right)$	$\left(\frac{p_x}{m_x}\right)$
FRANCE.						
0 to 25	220,632	16,455,389	74.5	14,052	1,046,874	.063
25 „ 40	69,632	8,454,624	121.4	31,942	3,877,758	.458
40 „ 50	58,542	4,689,642	80.1	36,261	2,904,506	.619
50 „ 60	76,692	3,965,684	51.7	56,707	2,931,752	.739
60 „ 70	121,227	2,900,002	23.9	85,712	2,048,517	.707
70 „ 80	149,119	1,518,381	10.2	89,560	913,512	.600
80 and over	84,196	350,055	4.1	42,076	172,511	.498
	780,040	38,333,777	49.13*	356,310	13,895,430	.4568*
ENGLAND.						
0 to 5	199,877	3,737,700	18.7	5	101	.000025
5 „ 10	13,741	3,523,200	256.4	5	1,381	.0004
10 „ 15	7,604	3,371,600	443.4	11	4,777	.0014
15 „ 20	10,583	3,249,000	307.0	31	9,591	.0029
20 „ 25	12,981	3,094,700	238.4	270	64,461	.0208
25 „ 35	29,811	5,202,100	174.5	1,766	308,110	.0592
35 „ 45	37,685	3,953,100	104.9	3,942	413,370	.1046
45 „ 55	45,351	2,884,400	63.6	6,666	423,970	.1469
55 „ 65	57,435	1,929,800	33.6	10,894	366,050	.1897
65 „ 75	66,899	1,077,100	16.1	13,740	221,210	.2053
75 and over	64,187	436,480	6.8	14,084	95,780	.2194
	546,154	32,459,180	59.43*	51,414	1,908,801	.94139*

* Not the total.

Statistics have, however, been published in France showing in categories of age the numbers of deceased persons who left estates during the year 1906; but, unlike the statistics at Mr. Mallet's

disposal, no particulars have been given of the average *values* of the estates at the different ages nor of the aggregate value in each category.

Working on these details M. Séailles has arrived at the widely different figure of 39 for France, by reasoning, in some respects so closely analogous to that of Mr. Mallet that it may be well to examine briefly the facts on which they base their respective conclusions.

The statistical details for France are shown in Table 2; and the corresponding particulars used by Mr. Mallet, and classified in a precisely similar manner for England, are also appended. An algebraical notation has been included in the headings showing the relations *inter se* of the various functions of the age (x).

M. Séailles observes that "all the causes of increase of *fortune* are a function of age"—a proposition borne out by Mr. Mallet's figures both for 1905 and 1906, where the average estate passing by decease increases up to the most advanced age at death. "Before 40 years of age," observes M. Séailles, "it is rare that a person has received the inheritances that would normally fall to him. At the same time possibilities of personal saving hardly exist before he has reached a certain age, often fairly advanced, to which his more ripened capacities and experience correspond, if commercial and industrial activities are under consideration; or, if an employment or office is involved, his promotion and the higher salary attained."

But when a still more advanced age is reached, M. Séailles considers that a contrary tendency begins to make itself felt, and savings diminish "par suite de l'action croissante des dotations, des partages anticipés et des viagers." Thus he is led to the conclusion that "*fortunes*" or "estates" increase with age up to a certain point and then decrease as the age further advances. In this latter respect the inference differs from the facts derived from the English experience presented by Mr. Mallet, for the estates increase in value with the ages up to the most advanced period of life (see Table 4, col. 3). Doubtless, however, conditions in France are very different from those in England, both as to the laws of inheritance and the customs regarding "dotations, &c.," enumerated above. There seems, therefore, no reason to question the general correctness of M. Séailles's conclusion taken qualitatively. But in the entire absence of figures, it is conceivable that quantitative estimates of the results of the tendencies enumerated by him might give very diverse results. For instance, the tendency of successful businesses to grow after the proprietors have reached (say) 50 years of age might just be neutralised by the gifts *inter vivos* which it is customary to make in France at that period, in which case the average *fortunes* derived from business and left by deceased persons of that age and upwards would be stationary. In short, we can well imagine that with the same tendencies at work, but in different proportions, not only *fortunes* might remain stationary or decrease after 50, but they might actually increase, though much more slowly than at earlier ages.

M. Séailles is, however, not only sure of his inference that they decrease in the later years of life, but he supplements that inference

by another. He notices that the ratio of the number of deceased estate owners to the total number of deceased persons also increases with age until a certain period of life is reached, and then diminishes, as is shown in column 6 of Table 2 (French figures) given above, which indicates an increase up to an age somewhere between 50 and 60, and then a subsequent decrease.

Here then is M. Séailles's second inference. He says that it is at the same time logical and entirely probable that this variation in the ratio of the number of the propertied deceased to the total number of deceased should be the same as the variation in the average amounts of the *fortunes* left in each category of age. As the total value of estates left at all ages is quoted by M. Séailles as amounting to 5,351,000,000 francs it is quite easy, on this supposition, to arrive at the "*fortune totale*" and "*fortune moyenne*" for each category.

The results (including the consequent multiplier) are as follows:—

TABLE 3.—*France.*

Catégories d'âge.	Nombre de propriétaires vivants.	Fortune moyenne.	Fortune totale.
		frs.	frs.
0 à 25	1,046,874	1,550	1,622,654,700
25 „ 40	3,877,758	11,290	43,769,887,820
40 „ 50	2,904,506	15,260	44,322,761,560
50 „ 60	2,931,752	18,220	53,416,521,440
60 „ 70	2,048,517	17,500	35,869,047,500
70 „ 80	913,512	14,800	13,519,977,600
80 et au delà	172,511	12,270	2,116,709,970
	13,895,430	90,890	194,637,560,590
$\frac{194,637,560,590}{5,351,000,000} = 36.37 \text{ the "multiplier."}$			

By further sub-division of categories the multiplier is finally raised to 39.46.

Now it is a simple matter to test this conclusion by making the same inference and going through precisely the same calculations with the English figures presented by Mr. Mallet; and then testing the results with those based on actual statistics as given by him. This has been done, and the results, as a matter of fact, show that M. Séailles's bold inference is very close to the truth.

In other words while, so far as England is concerned, Mr. Mallet's calculations upon actual data produced a figure of 6,098,000,000*l.* for the property in the hands of living estate owners, an amount roughly twenty-four times the total of the estates annually passing at death, calculations based upon M. Séailles's hypothesis give 7,061,000,000*l.*, an amount roughly twenty-seven times the total annually passing at death.

We are thus, it would appear, bound to conclude that M. Séailles's hypothetical method is to a certain extent justified by results, and that it is at least probable that the figure, 39 or thereabouts, though perhaps a little too high, is not far removed from the truth.

Even, however, if we reduce it by 3 or 4 and take the multiplier as, say, 35, we are still faced with the enormous discrepancy between the respective multipliers for England and France, especially if we consider that both may (for the moment) be regarded as the measure of the movement of a unit of property from one person to another by reason of death. In spite of differences in institutions, in laws, and in customs, it is impossible to believe that across the Channel each franc of "fortune" created or inherited remains on an average in the possession of one person for thirty-five years, while on this side of the Channel each pound made or inherited to form an "estate" passes by death from one person to another in twenty-four years.

In order to explain this discrepancy, let us adopt the hypothesis that the English people have the habit of behaving in the same way as the French do, and trace the consequences. Glancing at the English figures, we will suppose that the 366,050 living persons between 55 and 65 (Table 2, col. 5) with an average estate of 3,954*l.* (Table 4, col. 3), give up, by way of the "dotations, &c.," referred to by M. Séailles, an average of 1,000*l.* out of their several estates to persons between the ages of 25 and 35; that those between 65 and 75, numbering 221,210, with an average estate of 5,423*l.*, similarly dispose of 2,000*l.* each to persons between the ages of 35 and 45; and that the 95,780 persons over 75 each yield 4,000*l.* to the class between 45 and 55. It will be quite obvious that this mere transfer would not in any way affect the total amount of the estates in the hands of the living, given as 6,098,000,000*l.*; nor would it affect the average actual length of time during which property is held by the same person, but it would very considerably alter the distribution among the age classes. This distribution, contrasted with that given by Mr. Mallet, would be as follows:—

TABLE 4.—*England.*

Age classes.	1	2	3	4
	Mr. Mallet's figures showing the present distribution of property in age-groups of living persons.	The figures as altered by the supposed <i>donationes inter vivos.</i>	Average value of estate as given by Mr. Mallet.	Average value of estate as altered by the supposed <i>donationes inter vivos.</i>
	£	£		
0 to 5	37,400	37,400	400	400
5 „ 10	13,946,000	13,946,000	10,878	10,878
10 „ 15	3,400,900	3,400,900	697	697
15 „ 20	6,474,700	6,474,700	680	680
20 „ 25	53,383,000	53,383,000	829	829
25 „ 35	335,340,000	701,390,000	1,088	2,276
35 „ 45	735,750,000	1,178,170,000	1,779	2,850
45 „ 55	1,591,100,000	1,974,220,000	3,753	4,656
55 „ 65	1,447,600,000	1,081,550,000	3,954	2,954
65 „ 75	1,199,700,000	757,280,000	5,423	3,423
75 and over....	711,180,000	328,060,000	7,426	3,426
	6,097,912,000	6,097,912,000		

The average values of the estates held by living persons at the various ages would also be considerably altered, as shown by a comparison of the figures in columns 3 and 4 of the table given above (Table 4). In short, estate owners between 25 and 55 would habitually possess estates much larger than at present, and those of 55 and upwards would be correspondingly impoverished. This supposed difference of custom would necessarily be revealed in the disclosure of the values of estates ascertained to be owned by deceased persons in any year for the purpose of the collection of estate duty. These altered values can be readily obtained by multiplying the mean values of estates in the several categories of age by the numbers dying within the year. Here then is a comparative statement, showing, first, the various total values of estates passing by death in the several age categories, as they actually were in 1906, and, secondly, these values as they would have been had the custom prevailed of making *donationes inter vivos* in the proportions supposed.

TABLE 5.—*England.*

Age classes.	Amounts of estates taxed in 1906 as passing by death.	Amounts corrected to accord with the foregoing supposition.	Results.
	£	£	
0 to 5	2,000	2,000	Unaltered
5 „ 10	54,390	54,390	
10 „ 15	7,670	7,670	
15 „ 20	21,090	21,090	
20 „ 25	223,920	223,920	
25 „ 35	1,921,680	4,019,500	Greater
35 „ 45	7,013,750	11,235,000	
45 „ 55	25,017,500	31,000,000	
55 „ 65	43,083,000	32,189,000	Less
65 „ 75	74,514,000	48,034,000	
75 and upwards	104,586,000	48,250,000	
	256,445,000	175,037,000	The multiplier = 6098 (Table 4) 175 = 35 nearly

Thus we find that if in England it were the custom as, according to M. Séailles, it is in France, for old people to hand over to the younger generation large sums by way of gifts, so much property would escape revelation at death that the multiplier to be used in ascertaining the value of estates in the hands of the living would be increased from 24 to nearly 35. But it may particularly be noted that such a custom implies not the slightest alteration in the length of time during which each unit of property remains in the same hands. If 24 be the measure of the movement of property in the one case, it is equally so in the other, in spite of the multiplier running up to 35; because, although certain old people part with their property sooner under the influence of our imagined custom, they received it from others as much sooner when they were younger.

But in England a certain amount of property passes *inter vivos*,

and thus escapes revelation, though the ratio of such gifts to the property passing at death is believed to be relatively small. It follows from this that the figure 24 may be itself too high, regarded as a measure of the movement of property.

To sum up, the conclusion seems inevitable that in the ideal case of a country in which all property, either created or received, is retained up to death, and where, consequently, there are no *donationes inter vivos*, the multiplier is much more than is implied in the definition already given. It is not only a multiplier, but is also a real statistical or physical constant, and it measures in terms of years the actual average movement of property from one to another by reason of death; it also seems provisionally to be shown by Mr. Mallet that this constant does not exceed 24. But if from any causes, such as the customs referred to by M. Séailles, any considerable amount of property fails to be disclosed in the death duty statistics for a given year, the figure required, *quâ* multiplier, may be considerably increased, but will then cease to represent the number of years during which a unit of property is held by one person.

Although not falling strictly under the heading of these notes, it may not be out of place to call attention to the formula of distribution proposed by M. Séailles as being more general than that of Pareto.

The law of Pareto, it is well known, is of limited application only, and is apt to fail at both ends of a series treated. Mr. A. L. Bowley, for instance, found that the formula applied with fair accuracy to the classified statistics of estate duty, excepting where the estates were of very high value (see H. of C. paper 365, year 1906, p. 222); and it has been ascertained, on the other hand, that the law applies to the Prussian income-tax figures [Cd-2587, p. 5] with fair precision if it is not pushed to the numbers with very small incomes.

The equation itself reveals its own limitation for numbers with small incomes or values, as by taking x (the income) indefinitely small, N (the number of persons with incomes of and over x) becomes indefinitely large, and, as M. Séailles observes, may thus be made to exceed the whole population whose incomes or other values are considered. M. Séailles notices that when these classified returns are treated cumulatively so as to form for N the number of cases over the value x , the logarithms of N and x , when graphically treated, give a series of points forming a slightly bow-shaped curve, whose concavity faces the intersection of the axes, and tentatively concludes, from the parabolic form of the curve, that a more general formula embracing the lower values is to be found in the equation

$$(\log x)^2 = 2p \cdot \log N + q.$$

In this connection I may mention that in an unpublished note on a case of distribution of wealth, the basis of which consisted of a table, relating to the year 1715, of forfeited estates of varying values belonging to non-jurors, &c., Mr. Udny Yule was able to fit the figures given into an equation, $\eta = a + b\xi - c\xi^2$, where $\eta = \log y$ and $\xi = \log x$. The curve was not, however, like Pareto's, an

integral curve, but was formed from the successive figures included within small intervals without cumulation. Other values have also been fitted into curves of greater generality than that of Pareto.

It is thought, therefore, that the difficulty connected with this problem is not mathematical, but arises from our comparative ignorance of the distribution of wealth among the poorer classes, and it is worth while to consider a little more particularly what is the actual problem to be solved. We have Pareto's formula

$$N = \frac{C}{x^{\alpha}}, \quad (1)$$

where N is the number of persons with an income of or above x . Consequently, the equation

$$\frac{dN}{dx} \text{ or } N' = \frac{C\alpha}{x^{\alpha+1}} \quad (2)$$

gives the number of persons with the *exact* income x .

But the table of income corresponding to that of the numbers will also be implicated with these equations; for, if we multiply the last equation by x , thus,

$$N'x = I' = \frac{C\alpha}{x^{\alpha}}, \quad (3)$$

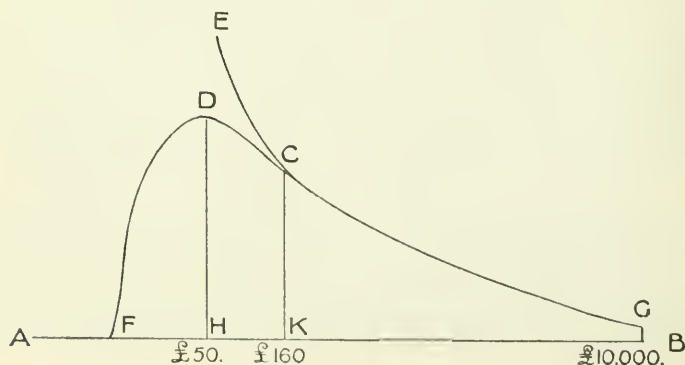
we obtain the aggregate income of the number of persons whose income is exactly x , and

$$\int I'dx = I = \frac{C\alpha}{(\alpha-1)x^{\alpha-1}} \quad (4)$$

gives the aggregate income of the number, N , of persons with incomes above x , and corresponds, as regards incomes, to equation (1) relating to numbers.

It follows, therefore, that any equation more general than Pareto's should be such as will include incomes (or whatever values are dealt with) as well as numbers. It may be noted, *en passant*, that all four equations are of the same form, viz., $y = \frac{C}{x^{\alpha}}$, and are of limited application only for the reason already stated.

Referring to equation (2), it is quite obvious that it forms part of a larger curve, which, if applied to incomes, may take the following form:—



The curve CG is supposed to answer to the equation $N' = \frac{C\alpha}{x^{\alpha+1}}$, and to be true of numbers and incomes, say, from 160*l.* to 10,000*l.* per annum, where the incomes are measured off along AB, and the numbers represented by verticals, such as CK and GB. It may also be supposed that were this curve continued to the left in accordance with the equation it would take the course indicated by CE, and would continue to rise indefinitely upwards from the axis AB, and thus be the graphic representation of the absurdity, already alluded to, of too large a number with inappreciable incomes. But there will most probably be a *maximum* number of persons at some small income. Suppose, then, we imagine that there are more persons earning, say, 50*l.* per annum, than there are persons earning 49*l.* or 51*l.*, or 48*l.* and 52*l.*, and so on. The ordinate DH would then represent that *maximum* number, and the curve would take the direction CDF, descending sharply along DF towards the line AB, because the incomes from the *minimum* income to 50*l.* would take up a very small portion only of AB, as compared with the length KB, which represents the large range of incomes from 160*l.* to 10,000*l.*

As far as this country is concerned it is even possible that there might be other *maxima* on the left of the line CK, owing to a combination of causes. We know that 1*l.* a week is a small wage for a man, but it is at present considered a fair one for a woman (say a seamstress or a typist), and a very large one for a boy. From the combination of these circumstances the curve at the left of DH might present various irregularities, not at present known.

Now if this total curve GCDF should possess an equation, capable of integration, the equation of the integral, reduced to logarithms, would, so M. Séailles suggests, be of the form

$$(\log x)^2 = 2p \cdot \log N + q.$$

But, speaking generally, it is precisely the facts relating to the unknown, or little known, portion of the curve on the left of the vertical CK, which this new equation is designed to embrace. It would not be true to say that no facts are known of the poorer classes, for in the Prussian figures the *minimum* income brought under review is as low as 45*l.* per annum, and it is well known that eminent statisticians and others have made many and careful observations as to the rates of wages, &c., amongst the poorer classes. But these facts are not known to us in the definite sense or organised form in which the incomes, or values of estates, of a higher class are known or can be inferred. It is, however, true that in the "classement" given by M. Séailles, the numbers and amounts of *fortunes* of as low a value as one franc are given, from which at first sight much might be inferred, but there is unfortunately every reason to regard the figures as very untrustworthy. M. Séailles himself lays considerable stress on the fraud and evasion that must necessarily occur in the valuation of estates in France; and, so far as England is concerned, it may well be supposed that the representatives of deceased persons take a very biased view

of the value of the property left, whenever it is subject to doubt. In the higher categories of the "classement," where the range of value is large, comparatively few *fortunes* would, in spite of such undervaluations, fall to lower categories, and none would be altogether excluded from classification; but in the lowest category many would fall entirely out of the table. Moreover, fraud and evasion are relatively easy in dealing with the simple estates of the poor, who are also much more liable to temptation.

These circumstances render it quite certain that the number of estates (118,555) in the category from 1 to 500 francs is very much understated, and that the number (104,225) in the next category (500 to 2,000 francs) most probably suffers from the same defect. This conclusion is confirmed by the fact that the calculated mean values of the *fortunes* are in excess of the respective averages of the minima and maxima of the two classes considered.

We seem therefore to be quite in the dark as to the real figures; but in the meantime the ingenious and luminous conjecture of M. Séailles, though requiring for its acceptance further information and experience, seems to be worth consideration and investigation by those mathematicians who are interested in the formation of statistical generalizations.

II.—On the Interpretation of Correlations between Indices or Ratios.

By G. UDN YULE.

THE present note is concerned with the interpretation to be placed on the results obtained by Professor Pearson in his Paper "On a Form of Spurious Correlation which may arise when Indices are used in the Measurements of Organs" (*Proceedings of the Royal Society*, vol. ix, 1897, p. 489). As these results may not be generally familiar to the Fellows of this Society, I may perhaps summarise them here.

If r_{12} , r_{13} , &c., are the correlations between four organs, or, generally, four variables of any kind, and v_1 , v_2 , v_3 , v_4 their coefficients of variation (the ratios of the standard-deviations to the means), the correlation ρ_{12} between the indices x_1/x_3 and x_2/x_4 is given approximately by

$$\rho_{12} = \frac{r_{12} \cdot v_1 v_2 - r_{14} \cdot v_1 v_4 - r_{23} \cdot v_2 v_3 + r_{34} \cdot v_3 v_4}{\sqrt{v_1^2 + v_3^2 - 2r_{13} \cdot v_1 v_3} \sqrt{v_2^2 + v_4^2 - 2r_{24} \cdot v_2 v_4}} \quad (1)$$

provided that deviations may be assumed to be small compared with the mean. Hence, if the organs or variables 3 and 4 are identical,

$$\rho_{12} = \frac{r_{12} \cdot v_1 v_2 - r_{13} \cdot v_1 v_3 - r_{23} \cdot v_2 v_3 + v_3^2}{\sqrt{v_1^2 + v_3^2 - 2r_{13} \cdot v_1 v_3} \sqrt{v_2^2 + v_3^2 - 2r_{23} \cdot v_2 v_3}} \quad (2)$$

It follows that the correlation between the two indices, or ratios, x_1/x_3 , x_2/x_3 does not vanish, even if the three variables in question are completely uncorrelated; for in this case

$$\rho_{12} = \frac{v_3^2}{\sqrt{v_1^2 + v_3} \sqrt{v_2^2 + v_3^2}} \quad (3)$$

The value of ρ_{12} given by (3) Professor Pearson termed the "spurious correlation": for a number of "indices" based on biometric measurements he found it possessed values ranging from 0.38 to 0.49, and concluded that "the method, which judges of the intensity of organic correlation by the reduction of all absolute measurements to indices, the denominators of which are some *one* absolute measurement, is not free from obscurity." He added that the conclusions of his Paper "although applied to organic correlation are equally valid so far as concerns the use of indices in judging the correlation of either physical or economic phenomena." The note by Professor Pearson in the May number of this Journal* is, in fact, descriptive of an ingenious method for circumventing the possibility of such spurious correlation in the special case of two death-rates referred to the same population.

But it does not seem to me that there can be any real fear in such a case of a "spurious correlation"—*i.e.*, a correlation due *solely* to the varying numbers of the populations in the several districts dealt with: a misleading correlation due to variations in the age or sex composition of the populations is of course quite another matter, but can be avoided by well-known and simple methods of correction, or by limiting consideration to one sex within narrow limits of age. To put the argument as regards the use of indices in a general form, I should distinguish three cases.

Case i. If the causes, the nature of which we wish to elucidate, influence directly the absolute magnitudes of the variables x_1 and x_2 , or the mode in which their values are combined, the correlation between the two indices or ratios x_1/x_3 and x_2/x_3 will be misleading; the correlation should be worked out between x_1 and x_2 .

This case is admirably illustrated by an illustration given by Professor Pearson (*loc. cit.*). "For example, a quantity of bones are taken from an *ossuarium*, and are put together in groups, which are asserted to be those of individual skeletons. To test this a biologist takes the triplet femur, tibia, humerus, and seeks the correlation between the indices *femur/humerus* and *tibia/humerus*. He might reasonably conclude that the correlation marked organic relationship, and believe that the bones had really been put together substantially in their individual grouping. As a matter of fact, since the coefficients of variation for femur, tibia, and humerus are approximately equal, there would be a correlation of about 0.4 to 0.5 between these indices had the bones been sorted absolutely at random."

The imaginary biologist in question combines certain absolute lengths (x_1 and x_2). If he wishes to test whether the combination has

* "On the correlation of death-rates," p. 534.

been at random or not at random, he must therefore work out the correlation between these absolute lengths, x_1 and x_2 : the correlation between the indices will be misleading.

Case ii. If the causes, the nature of which we wish to elucidate, influence directly the ratios or indices, x_1/x_3 and x_2/x_3 , or the mode in which these ratios are combined, the correlation between the absolute values of the variables, x_1 and x_2 , will be misleading: the correlation should be worked out between x_1/x_3 and x_2/x_3 .

This is the case of death-rates. All the causes in which we are interested—the nature of which we wish to elucidate—determine directly the *death-rate*, not the number of deaths. The number of deaths is determined mainly by the population of the district. It is clearly the *ratio* of deaths to population which is directly influenced by the sanitary character of the district and the physical character of the individuals living therein. If, therefore, we wish to find whether the sanitary character of the district or the physical characteristics of its inhabitants have a common influence on any two diseases, we must work out the correlation between the death-rates due to such diseases, correcting of course for age and sex distribution and for the presence of institutions, so far as may be possible. If there is no common influence of any kind, the correlation will be zero. There is not, it seems to me, any question whatever of a “spurious correlation” due to variations in the magnitude of population alone. To enforce the point, we may note that, within the limits of sampling, the death-rate of a district will be precisely the same, whether we deal with the whole population or with a random sample of it of any given size. We may then take from every district a sample of constant size, and obviously no question of spurious correlation can then be raised; but the correlation will, within the limits of sampling, be the same as before.

This case is, in fact, precisely the converse of the last; the correlation between the absolute values of the variables has become the “spurious” or misleading correlation. Suppose we combine at random two indices, z_1 and z_2 , *e.g.*, two death-rates, and also combine at random with each pair a denominator or population, x_3 . The correlations between z_1 , z_2 and x_3 will then be zero within the limits of sampling. But now suppose we work out the total deaths $x_1 = z_1 x_3$ and $x_2 = z_2 x_3$; the correlation r_{12} between x_1 and x_2 will not be zero, but positive. Assuming, as in Professor Pearson’s case, that all deviations are small compared with the mean, I find, $u_1 u_2$ being the coefficients of variation of z_1 and z_2 , v_3 the coefficient of variation of x_3 , the *spurious correlation* between x_1 and x_2 is

$$r_{12} = \frac{v_3^2}{\sqrt{u_1^2 + v_3^2} \sqrt{u_2^2 + v_3^2}}. \quad (4)$$

The expression, it will be noted, is of precisely the same form as (3).

I am disposed to think, accordingly, that the process of correction suggested by Professor Pearson is unnecessary, and my view is supported by the result of his investigation in Dr. Maynard’s case, so far as a single result goes. For Dr. Maynard found a correlation between the corrected death-rates from cancer and diabetes of 0.73.

Professor Pearson, making the further correction for total population, only alters this to 0.71.*

Case iii. If we have no knowledge of the mode of operation of the causes in the case under consideration, either the correlation between the indices z_1 and z_2 , or the correlation between the absolute values of the variables x_1 and x_2 , or both, may be misleading.

This, as it seems to me, includes the case principally considered by Professor Pearson in his original note on "spurious correlation"—the case of correlation between measurements or indices on man or other animals. I concur with him in thinking that the interpretation of correlations between indices "is not free from obscurity"; but, in my view, this obscurity is no less for correlations between absolute measurements, seeing that we have at present no real knowledge of the process of ontogeny to guide us. If the factors in the fertilised ovum, whatever they may be, which determine, for a given environment, the ultimate form of the individual, determine directly the three distinct measurements x_1 , x_2 and x_3 , then, certainly, the correlation between the indices x_1/x_3 and x_2/x_3 is misleading, and cannot be regarded as an index to any relation between the germinal factors in question. If, on the other hand, these germinal factors determine directly the two indices z_1 and z_2 and the measurement x_3 (two determinations of shape and a determination of the general size of the animal), then the correlations between the absolute measurements x_1 and x_2 are misleading. If the form of the animal is determined in some quite different way, both correlations become equally misleading. We have at present, so far as I am aware, no special reason for supposing that correlations between indices (organic indices) are more likely to be misleading than correlations between any other measures of shape or size.

* P. 537 above. I may perhaps add that, if Dr. Maynard had dealt with a series of districts of very diverse character, some rural, some urban, a correction for population might conceivably have a more appreciable effect. For, in this country at least, the registration districts with largest populations are urban districts, and a correction for population would effect a partial correction for degree of urbanisation.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Earnings and Hours Inquiry*. Report . . . by the Board of Trade . . . *Earnings and Hours of Labour . . . in the United Kingdom*. III. *Building and Woodworking Trades in 1906*. Cd-5086. 1910. Price 1s. 10d.

The Board of Trade does not get on very quickly with the publication of the results of its Wage Census. The particulars in this volume are already three years old, and at the present rate of issue the whole Census will not be issued until the next one is due (unless we are again to wait twenty years, as between the first in 1886 and the one now under discussion).

The present volume deals with the building trades, construction of harbours, docks, roads, sewers, &c., saw milling, machine joinery and wood box and packing case making, and cabinet making and allied trades, including shop fitting and chair making.

In dealing with the textile trades the Board was fortunate enough to get rather more than 40 per cent. of the workpeople employed represented in its returns. In the building and allied trades the success is by no means as great, only 180,000 workpeople, or about 14 per cent. of the 1,250,000 persons which, it is estimated, these trades employ, being included. The Board of Trade seems quite satisfied with this result, as the returns are "sufficient to serve as a basis for an accurate statement of average earnings, owing to the widespread prevalence of standard time rates of wages for the principal classes of workpeople. In nearly every town of importance rates of wages and hours of labour have either been fixed by agreement between representative bodies of employers and the workpeople or, if not the subject of formal agreement, are well recognised. As a consequence, a small number of returns from a given town is usually fairly representative of local conditions."

It is quite true that as a rule a couple of returns from representative employers in a town will suffice for that town, but when these returns are averaged with similar returns from other towns to obtain district summaries, they may easily lead one astray, unless the relative sizes of various towns have been allowed for by process of "weighting." Take the Midlands for example. A couple of returns from Birmingham employers will be typical of Birmingham, but if only a couple are received, and a couple also from employers at Wolverhampton, the Potteries, and similar places, the result will work out too low, unless the rates in the small towns are the same as at Birmingham. As a rule they are lower. This makes a reviewer wonder whether the final results for any district would be the same if an approximately equal proportion of employees was represented in each town, or if the returns had been weighted according to population.

The results of this enquiry may be tabulated thus:—

	Average weekly earnings of workpeople who worked, 1906.						Annual earnings.	
	Full time.			Less or more than full time.				
	Men.	Boys.	All.*	Men.	Boys.	All.*	(a.)	(b.)
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>£ s.</i>	<i>£ s.</i>
Building	33 0	9 7	28 1	31 6	10 3	28 6	68 0	69 10
Construction of } harbours, &c. }	31 10	13 6	30 11	27 0	13 1	26 5	64 10	64 10
Saw milling, &c.	27 4	9 8	22 4	27 1	9 8	22 7	55 10	56 10
Cabinet-making, &c.	33 0	8 7	24 5	32 1	8 10	25 3	62 0	63 10
Above industries	32 0	9 6	26 7	30 8	9 11	27 1	—	—

* Including a few women and girls.

A very curious result is here produced. The average wage of all employed is higher when those working short time or overtime are included than when only those working ordinary time are taken, despite the fact that, on the average, everybody *lost* time in 1906. The reason is that there were only 5,000 boys who did not work ordinary time, but 76,000 men who lost some time. If we recast the result in what, I submit, is a more correct form, by taking the full-time rates and applying them to all men and boys, we get this result, namely, "That if all employed had worked full-time in 1906, their average wage would have been 28s.; in actual practice, so many lost time (on the average) that the wage is reduced to 27s. 1d."

This is a slight matter. The method adopted by the Board of Trade of calculating the average *annual* earnings (columns (a) and (b)) is open to much more serious criticism. It is no exaggeration to say that these are seriously over-stated. They are calculated on two

different plans: (a) is obtained by dividing the average of twelve monthly numbers employed into the total wages paid, and (b) the department calculated from the weekly rates, taking "the ascertained averages for all workers (*i.e.*, those who worked full time and those who worked less or more than full time) in the week for which details have been given, and multiplying that figure by the number of weeks in the year, making a proportionate deduction for the shorter working week in winter, where necessary, and for holidays." The net working time thus arrived at is: building, 48·6 weeks; harbours, &c., 48·7 weeks; saw milling, &c., 50·3 weeks; and cabinet making, 50·2 weeks.

In suggesting that the above figures are too high, it should be borne in mind that these trades are notorious for their discontinuity of employment, and there will have been, in any one year, more men employed at some time during the year than will be indicated by the *maximum* number employed on any one day, and probably, more than the sums of the *maxima* of all the employers making returns, taken together. True, men shift from employer to employer very often—one carpenter may work for as many as six employers in one year—but the *maximum* number employed at the end of any one month by all the employers making returns will probably be much less than the *maximum* number employed if each employer's *maximum* is taken, and all the *maxima* are added together. In all probability, therefore, the 115,943 persons employed in May by firms making returns is an under-statement of the total number of persons among whom the 7,516,776*l.* paid in wages during the year in building trades is divided. Yet, if we take this number we get an average of 6*4* $\frac{3}{4}$ *l.* only, instead of the 69 $\frac{1}{2}$ *l.* estimated by the Board. On this basis we get as annual average earnings in 1906:—

	£
Building, &c.	64 $\frac{3}{4}$
Harbours, &c.	60 $\frac{1}{2}$
Saw milling, &c.	54 $\frac{3}{4}$
Cabinet making, &c.	60 $\frac{3}{4}$
	—
Above industries.....	62 $\frac{1}{2}$
	—

In each case this result is considerably under that of the Board of Trade.

If full time had been worked by all for 52 weeks, the averages would have been 75*l.*, 80 $\frac{1}{2}$ *l.*, 58*l.*, and 63 $\frac{1}{2}$ *l.*, respectively. In other words, in building the lost time from all causes is 14 per cent.; in harbours, 25 per cent.; in saw-mills, 6 per cent.; and in cabinet-making, 4 $\frac{1}{2}$ per cent.

The hours of labour in this group of trades are—building, 52·9 per week in summer, and 45·9 for 14·3 winter weeks; in the construction of harbours, &c., 55·8 in summer, and 50·3 for 15·9 winter weeks; in saw-milling and cabinet-making, where the winter week is of the same duration as the summer week, the hours are 54·4 and 53·1 respectively.

G.H.W.

2.—*L'impôt sur le revenu*. Par Just Haristoy, Docteur en droit. 881 pp., 8vo. Paris: Felix Alcan, 1910. Price 12 frs.

This work is not so much an economic or statistical study of the taxation of income as a polemic against the proposed French income-tax. A "league against the income-tax and fiscal inquisition" has, it seems, been formed to "provoke, encourage and fortify the hostility of the taxpayers" to the Bill now before the Senate, and M. Haristoy frankly states that he has been commissioned to write in support of the principles of this league.

The author, therefore, while admitting that in theory an income-tax is the most equitable of all forms of taxation, insists on the imperfections of all existing income-taxes, and especially on their inquisitorial and vexatious character, which he thinks will prevent their responding to the increasing demand for justice in modern societies. His survey of the income-taxes of the United Kingdom, of Prussia and of Italy are interesting from this point of view, but add little by way of information to the numerous studies of these taxes which have appeared in recent years. His criticisms of our own income-tax, with their quotations from Mr. Hubbard, Mr. Lowe and Mr. Gladstone, will strike an English reader as somewhat old-fashioned, though they may not be the worse for that. He notes recent developments with alarm, and without, as it seems to us, sufficiently appreciating their advantage from the point of view of fiscal equity and social justice, and he attaches exaggerated importance to the admissions which have been made in the course of one or two recent official inquiries as to the existence of evasion under Schedule D. He makes much of the evidence of the unpopularity of the tax, and it is therefore unfortunate that he should have been unable to note the marvellous manner in which officials and taxpayers have combined to minimise the difficulties arising from the rejection of last year's Budget—the most striking demonstration which fiscal history has ever afforded of the solidity of a tax as an institution.

The most valuable part of M. Haristoy's book is the sketch of the growth of the French fiscal system and its development on the lines laid down by the Constituent Assembly during the Revolution. It would be rash for an English writer to dogmatise on a system so complicated and so different from our own; but M. Haristoy's own admissions justify the comment that reform has been far too long postponed, and that the French system, however well adapted it may be to the idiosyncracies of the people, now conforms far less than that of any highly-civilised nation to modern ideals in the matter of taxation. We believe it is true, as M. Haristoy asserts, that as large a proportion of the revenue in France as in most countries is raised from direct taxes; but in the absence of any serious attempt at progression or graduation, these taxes, in their variety and complication, must apparently fall with crushing weight on the masses of the taxpayers. Whether reform should take the form of a reconstruction of the existing direct taxes or that of their replacement by the projected income-tax, of which M. Haristoy gives a most careful and valuable account, is the question to which he

addresses himself, arguing throughout for the former course. On the one side there is the advantage of a traditional system to which the population is accustomed, the immense difficulty of changing it, and the excessive sensitiveness of Frenchmen in regard to their incomes; on the other, the agreement of French political financiers in favour of an income-tax, and the absolute necessity of providing for an increase and expansion of the revenue, which apparently cannot be done by any further tinkering with the existing system. The question is primarily a political one, and therefore, perhaps, not one for further discussion in the pages of this Journal. B.M.

3.—*Skatternes fordeling efter indtægt og forsørgelsesbyrde. Norges officielle statistik V. 104. Socialstatistik VIII. 81 pp., 8vo. Kristiania: Aschehoug & Co., 1909.*

The Norwegian statistical bureau has, in this report, given the results of an inquiry of great interest, and no little difficulty, into the variation of the burden of taxation according to the income and the size of the family of the tax-payer. In addition, as part of the material gathered for the study of the problem, the appendices to the report contain a number of household budgets, among which twelve, representing each a year's expenditure of a working-class family, are given in much detail, as well as a considerable amount of other material.

The tax-burden to be estimated is made up of direct taxes levied both by communal authorities and by the central Government, and of the increase in cost of living due to the customs duties levied on a large variety of imported goods. The latter claim attention first in the report, in which a distinction is drawn between the price-effects of purely fiscal customs duties and those of protective or partly protective duties. The former are assumed to be added to the prices of the goods affected, while as to the latter, calculations are presented both on the assumption that the entire tax is added to the price, and on that of half the tax being so added on the average. In dealing with goods, the material for which is subject to a duty on importation, the duty on the material is computed in relation to the price of the completed product. The problem is full of difficulties, and while some may think that too much has been allowed for the effect of import duties in raising prices, others may probably urge that, when materials are subject to a duty, the goods made out of them experience a rise of price more than equal to the sum exacted by the revenue officials. Allowance must also be made, as the report points out, for the fact that peasant families which supply their own needs, in whole or in part, for many food products, and some other classes of goods as well, by their own labour, are not burdened by import duties except in regard to the articles which they need to purchase. This consideration is of particular importance in regard to the more modest incomes of dwellers in the country districts.

For food the expenditure shown by the special budgets amounted to about one-half the total annual outlay in Christiania and somewhat more in the country, if home-produced food be included in the

accounts at a suitable valuation, as is done in the report. For clothing a varying proportion, averaging between 13 and 14 per cent. of the total expenditure is shown. Both for food products and for clothing the inquiry shows that the burden due to taxation is relatively decreasing as the income increases. With increase in the size of the family, the burden becomes heavier in proportion to income. On the average of the special budgets, the tax-burden, calculated on the basis of the full addition of the customs duties to the prices of the goods concerned, amounted to nearly $7\frac{1}{2}$ per cent. of income, to which the duties on alcohol and tobacco would add about $1\frac{1}{4}$ per cent. These are the effects of duties which, in 1901-05, averaged 11.4 per cent. of the value of imported goods. As about 30 per cent. of the burden as calculated is due to purely fiscal duties, and 70 per cent. to protective duties, the assumption that, taken one with another, only half the latter are added to prices of dutiable goods, would reduce the $7\frac{1}{2}$ per cent. to about 4.8 per cent.

The direct taxes, the effect of which has also been calculated, are levied according to scales varying from one commune to another, but having in common a deduction from the gross income to determine the taxable income, and the inclusion in that deduction of an allowance for dependent children. Consequently, the direct taxes are more strongly progressive than the indirect taxes are regressive, with the result that the total tax-burden is progressive. It may be interesting to note that, including the communal direct taxation as well as the taxes of the central Government, incomes of about 50*l.* a year are calculated to bear a burden of about 10 per cent., which increases to about 20 per cent. for incomes of 500*l.* or more. Of the taxation on the smaller income named, direct taxes account for as little as one-tenth if there be four children in the family, and over one-third if there be none. These proportions become three-fifths and two-thirds respectively for the larger income named. For large families the burden is somewhat higher when the income is small, somewhat less when the income is large, than for small families, owing to the operation of the scales on which the communal dues are assessed. The modification needed if the burden of import duties be not added in full to prices has already been indicated.

Did space permit, the material and methods of this interesting report would well merit comment, but we restrict ourselves to its results.

A.W.F.

4.—*Lezioni di Statistica.* By Augusto Bosco. I. *Metodologia Statistica.* xii + 718 pp., 8vo., 1909. II. *Svolgimento storico della Statistica.* 109 pp., 8vo. Rome: Loescher, 1909. Price 16 lire.

This work was compiled by P. Mengarini, A. Tamburini, and others, from lectures and lessons given by the late Professor Bosco at the University of Rome. The greater part of the compilation was effected under Professor Bosco's personal supervision, and the work was originally intended only for a small circle of students. The compilers decided, however, in issuing the book after their master's premature death, to place it at the disposal of a wider public, especially with a view to giving those who had not had the benefit of

direct acquaintance with the Professor's remarkable personality a chance of following his ideas and methods in the form in which he imparted them to his students. From this point of view it is interesting to read the short biographical sketch and description of his work, reproduced from a commemorative address by Senator Bodio, which forms a preface to the book. It appears that Professor Bosco preferred to teach statistics as an independent science of method in research, considering incidentally the actual application of statistical methods to practical affairs, especially social problems. But although statistical method in practical use is his main concern (occupying the first and by far the larger part of the book) he also regarded as of great interest and importance the historical development of statistical methods, to which the second and smaller part of the work is devoted.

In a brief preface the compilers of the book do not claim for it the position of a scientific treatise. Its purpose is merely didactic. But at the same time it is far more than a set of lectures. It forms a connected whole, with the various parts of the subject carefully arranged in a logical sequence, the lines of which are briefly the following. Beginning with a chapter on preliminary notions, the Professor seeks to make clear to his students the nature of the "collective" phenomena, the observation of which forms the "raison d'être" of statistical science. From the outset he draws attention to the application of statistics to social problems, in which his special interest lies, and he devotes considerable space to the discussion of the practical functions and uses of statistics, accompanied by concrete examples. An analysis of the characteristics of statistical methods leads up to a consideration of the value of statistical data and the mathematical theory of probability which is explained at length and illustrated by a comparison of figures obtained from actual investigations and those calculated mathematically. Professor Bosco then takes up the question of statistical procedure in practice, dividing this part of the subject into six main heads:—(1) statistical observations and the formation of data; (2) errors of observation and the criticism of statistical results; (3) methods of arranging and manipulating statistical data; (4) averages and comparisons; (5) the regularity and variations of phenomena; concluding with (6) the investigation of causes and the determination of scientific laws, which may be regarded as the end to which statistical procedure is directed.

This summary will suffice to show the lines on which Professor Bosco instructed his pupils. The student who is not dismayed by the bulk of the book will certainly find in it much useful and interesting material for study.

S.S.

5.—*Die deutsche Fleischproduktion, ihr gegenwärtiger Stand und ihre voraussichtliche Entwicklung.* Von Heinrich Gerlich. Sonderabdruck aus: "Zeitschrift für Agrar-politik." 120 pp. Berlin, 1909.

This little volume consists of a thesis presented for the doctorate of the University of Kiel, and subsequently published in the official

journal of the *Deutscher Landwirtschaftsrat*. The marked rise in the price of meat in Germany in recent years—a phenomenon repeated in other great industrial countries also—has been ascribed in many quarters in part to the increased rates of Customs duties which came into effect in 1906, and Herr Gerlich's book is avowedly intended to justify the policy of excluding foreign supplies. He starts with the assumption that the food supply of a nation should, for both political and economic reasons, be drawn so far as possible from within its own territorial borders; and the thesis which he endeavours to prove is that in spite of the annual addition of nearly one million persons a year to her population (a rate which is, however, scarcely likely to be long maintained), and of the upward tendency of the *per caput* consumption of meat, Germany, if her agriculturists approach the problem in the right way, can for a long time adequately meet the increasing demand and so avoid the necessity of mitigating the restrictions imposed by the Customs tariff or sanitary regulations upon the importation of meat from abroad.

The first part of the book is devoted to an examination and criticism of the past and present statistics of the native meat production of Germany—the general suggestion being that there is room for very great improvement in regard thereto; its progress in relation to the increase of population and the rise in consumption (it is estimated that the consumption per head in Germany in 1908 was about 127 lbs. per head of population, including 9 lbs. of game and poultry); and the probable development of the demand—the assumption being that the normal rate of increase is about 1 lb. per head per annum. The second part of the book attempts to show that, by the spread of knowledge as to the best methods of breeding, improvements in fertilisers and the supply of artificial feeding stuffs, the utilisation for grazing of lands at present uncultivated, and other ways (one of them being the establishment by municipalities of pig-farms supplied with food by the systematic collection of kitchen refuse and its special treatment), the German home production can be so increased as to render the country for many years self-sufficing.

Although it may not be possible to accept all Herr Gerlich's conclusions, his book contains much interesting information as to the nature and conditions of the German meat supply, including such matters as the great preponderance in the national dietary of beef and pork, and the various preparations of the latter; the importance of goat rearing in certain districts; the decline in sheep rearing, the causes of which are considered at some length; and the unpopularity of mutton. There is an instructive discussion of the suitability of horse-flesh for human food, a contention which may be accepted, and a plea for the development of this source of supply; it is urged that the hostile prejudice might be removed without much difficulty if there could be a comparatively small improvement in the quality of the animals slaughtered, and incidentally it is suggested that the large consumption in Paris may be ascribed to the compulsory creation of a taste for it during the German siege. The slaughtering of dogs (very small and

confined to certain districts) is properly attributed to the utilisation of some parts thereof for medicinal purposes, and the allegations of an increase during the period of high meat prices in 1906-07 are dismissed as fables.

The discussion of the effect of price movements upon consumption seems very inadequate, and there does not appear to be any attempt to estimate the probable future trend of prices if the policy of self-sufficiency is adhered to; and this is a serious omission. Finally, two actual errors may be noted. The figures quoted in the table on page 20 for Australia actually relate to Austria, and in the table on page 65, showing the tariff rates of duty, the last two columns have apparently been transposed—the conventional tariff rates are consequently shown as being higher than the rates of the autonomous tariff, instead of lower. P.A.

6.—*Die Finanzgeschichte des Deutschen Reiches*. Von Emanuel Wurm. 272 pp., 8vo. Hamburg: Hamburger Buchdruckerei und Verlagsanstalt Auer und Co., 1910. Price 1 mark.

The number of books and pamphlets which deal, from various points of view, with the recurring difficulties of German imperial finance, grows apace; and the present volume makes an especially instructive addition to the list. It is in form a history of the financial legislation and administration of the Empire, and of the economic and political forces which have determined the lines of development; it contains very much interesting information (statistical and other), and a quite useful account and criticism of the growth of expenditure, the various forms of taxation which are or have been in force, and the numerous attempts at reform (mostly ill-starred). But it is also in essence and intent a political pamphlet; the author has attempted to formulate the orthodox doctrine of German social democracy with regard to the whole question—past, present and future—of German imperial finance, and to demonstrate that only in the acceptance of this doctrine and its practical application can the mass of the German people find salvation from the ills that beset them as the result of the rule of a pro-capitalist bureaucracy. He sets out to show that the growth of expenditure, and consequently of taxation, has been due solely to militarism and the efforts at colonial expansion; that these are in their turn dictated by the selfish interests of the ruling classes—the industrial capitalists, the great landowners and the higher bureaucracy; that these classes, divergent as their interests may sometimes appear to be, all combine to shift the constantly-growing financial burdens on to the shoulders of the lower-middle and working classes; that the forms of taxation in force have been devised, and varied from time to time, solely to this end; and that all political parties, other than the social democrats, have gradually, from divers motives, sometimes economic and sometimes purely political, become involved in the conspiracy, and will do nothing either to check the growth of expenditure or to secure a more equitable distribution of the resultant burdens.

It will be evident that any detailed examination of such a book

would involve the reviewer in the discussion of a number of highly controversial matters, which would be altogether out of place in the pages of this Journal. It must suffice to say that the author's views of the nature and incidence of taxation are simply those of Marx and Lassalle, and that in his account of the attitude of the Socialist party towards the present commercial policy of the German Empire and its naval policy, there is no recognition of the fact that there are or have been any Socialist dissenters from the orthodox faith. It is noteworthy also that while some 55 pages are devoted to a discussion of the relative merits of protection and free trade, and there is a long and fierce attack upon the present protection system, which it is alleged (p. 154) puts into the pockets of the landowners and manufacturers three times as much as the duties paid yield to the imperial exchequer, greatly enhances the cost of living in order to increase the profits of the landowners, while checking improvements by eliminating competition, and facilitates the formation of industrial combinations, no definite tariff policy is formulated; it is quite clear that the author is strongly opposed to all food duties, but it is not apparent what the policy of himself and his party is towards the industrial duties—whether the present protection should be abolished, or merely somewhat modified. The same lack of definiteness characterises the book in another respect also; there is no satisfactory indication of the financial policy which the author favours. There are indications that expenditure on social reform is to take the place of expenditure upon armaments; revenue from food taxation is to be abandoned; and the taxation of beer and tobacco is apparently to be reduced. To fill the consequent gaps recourse is to be had to *direct* taxation—the use of the word “direct” seems to be regarded as solving all difficulties—that is, to an imperial income-tax and death duties, and also to a number of State monopolies. But in view of the facts that the Socialist party is rapidly increasing in strength, and that its representation in the Reichstag will probably be largely extended at the next election, one would like to have a more definite statement of aims and methods; though possibly its leaders regard criticism as better and safer for electoral purposes than any declaration of constructive policy.

P.A.

7.—*Die deutschen Grossbanken und ihre Konzentration im Zusammenhange mit der Entwicklung der Gesamtwirtschaft in Deutschland.* Von Dr. Riesser. Dritte völlig umgearbeitete und stark vermehrte Auflage. xv + 715 pp., 8vo. Jena: Gustav Fischer, 1910.

The concentration or combination of industrial functions and activities is a striking phenomenon of modern economic life, and in tracing this movement in the case of the great banking concerns of Germany, Dr. Riesser is but describing one special aspect of an almost universal tendency. The introductory division of the present book states the general functions of banks, in normal times, in critical times, and in times of war, the most essential preparation for the last being the creation in times of peace of an “elastic credit system” and a “liquid or mobile reserve.” Dr. Riesser then

passes to an historical survey of banks in Germany, first in the period from the middle of the last century down to 1870, and next in the period from 1870 to the present time. Both parts of this survey are prefaced with a sketch of the general economic conditions of Germany in the respective periods, since the author rightly holds that there is an intimate relationship between these conditions and the fortunes of banking. "The numbers of their (the banks') functions and their sphere of influence have increased with the greatness, unity, and power of the Fatherland."

It is the second period, of course, which is most interesting to the general reader—a period starting from the stormy times of the Franco-German war, out of which, "as the mark of triumph," was born the German Empire. The main characteristics of the period are summed up as, "on the one hand, the great expansion in almost all spheres of public and private activity, combined with a shifting of the centre of gravity of the economic life of the nation from agriculture to industry," and, "on the other hand, the most intensive concentration of power, undertakings, and capital." In the midst of these two powerful movements grew up the German banking system, at once influencing, and being influenced by, these movements, and fulfilling the function of regulating the circulation of capital—the life-blood of the modern economic body—in numerous channels, just as the heart governs the circulation of the blood through the innumerable veins and arteries of the human body. Dr. Riesser in this section describes in some detail the development of the more important individual banks. In the course of this study many interesting topics are touched upon, such as, for example, the excess of German imports and the "balance of indebtedness." Dr. Riesser seeks to explain the excess of imports in much the same way as the excess of English imports is explained, namely, as consisting of interest on capital invested abroad, earnings of shipping, commissions, &c.

The fourth section of the book discusses more particularly the combination movement of banks in the second period. This movement is due to the two factors already mentioned, "expansion and concentration of capital, power, and undertakings," which stand to each other in the relation of cause and effect. The easy creation of capital is naturally conducive to the increase of capital, and this increase, Dr. Riesser states, tends to be proportionally greater, the greater is the capital—a doctrine, it may be remarked, which is much too dogmatically expressed, and one that is certainly not true beyond easily attained limits. Crises, kartells, and legislation have all played important parts in this concentration movement. As to crises, Dr. Riesser remarks that "one can in general observe that after a crisis the existing tendencies towards concentration and the rapidity of the movement are very considerably increased," by the necessity of the weaker concerns to unite with the stronger. The methods and form of the movement are systematically described at some length.

The fifth section of the book is concerned with the reciprocal influence of concentration in banking and in industry, while the

sixth, and concluding, part deals with the position created by the concentration movement, its advantages and dangers, and the outlook for the future. While, on the one hand, machinery tends to displace the individual worker and make possible a concentration of mechanical power, and on the other hand, joint-stock companies tend to squeeze out the individual undertaker and concentrate capital power, the outlook is still relieved by the fact that the perception of social duties has developed even more than this somewhat ruthless movement towards concentration. A.D.W.

8.—*La Suisse et l'Union monétaire latine. Etude économique et juridique.* Par Georges Paillard. 302 pp., la. 8vo. Paris: Félix Alcan, 1909. Price 3 frs. 50c.

This book, which not many years ago would have been subjected to torrents of criticism, can now be received with nothing but favourable notice. The very headings of the chapters ("La dépréciation de l'Argent" is one of them) would then have been a signal for a bi-metallic battle—Had silver depreciated or gold appreciated?

It is a praiseworthy and painstaking account of the formation and of the operations of the Latin Union, especially and particularly in its relation to Switzerland. It is brimful of details which every student of the subject will welcome. In the preface we read that all sorts of important matters depend on a right solution of the money problem—"Et l'importance du rôle de la monnaie métallique ne peut que grandir encore, car . . ." "Mais le question [of money] a une portée plus vaste, qui dépasse les frontières étroites de la Suisse et . . ." The author raises our hopes, and we could have wished that his facts, so well collected and focussed, had been used to illustrate his own views of some of the still disputed parts of the theory of money and monetary science. He is, however, true to his title, and though he occasionally steps aside and seems half inclined to start off into the regions where exploration is still necessary, he tantalisingly recovers himself and pursues the straight path of La Suisse and l'Union.

In the latter half of the book we are introduced, again with wealth of detail for which we are grateful, to the recently formed Swiss Bank of Issue, and to the "exchange" difficulty, particularly with France. The work concludes with two very well-reasoned chapters on "La dénonciation de l'Union latine." The arguments on both sides are so evenly balanced as to induce the reader readily to agree with M. de Foville and the author that "*quieta non movere.*"

We should have been glad to see a book so full of facts as this provided with an index. J.S.

9.—*La Question Sociale en Espagne.* Par Angel Marvaud. 475 pp., 8vo. Paris: Felix Alcan, 1910.

Of this interesting and informing volume it may be said without exaggeration that it fills satisfactorily a gap in the economic literature of our day. To many, if not most, English economic students Spain

is, in a very real sense, a "terra incognita," and they will accordingly welcome with gratitude the opportunity which is here afforded of learning what can be known about the present condition of its inhabitants. They will be glad to hear from so competent and judicial an observer as the author of this clear and industrious study what aspirations are and have been cherished, and what amount of practical achievement has been actually accomplished, by the various agencies which are striving to improve the distressful state that now prevails, whether by forcible revolution of that anarchist or "syndicalist" type which is the variety of socialism that has found almost exclusive favour in the Peninsula, or by voluntary methods of organised assistance by the Catholic Church or by other bodies, or, lastly, by legislative regulation, sometimes suggested or supported from such sources, which on paper holds out a promise that is unfortunately imperfectly fulfilled in fact. In M. Marvaud they will find a guide who has spared no pains to collect and arrange the available material. But, as he points out, so far at any rate as statistical evidence is concerned, its deficiencies in quantity and quality alike are unhappily more numerous and more conspicuous than its merits; and indeed we understand from the introduction to the essay that no less true, if more picturesque, a notion of the social question, as it presents itself in Spain, can be obtained from novels and from plays than from official publications. M. Marvaud has, however, supplemented his documentary research by personal observation, and by oral intercourse with representative opinion. A full bibliography is appended to his narrative, together with some useful tables of such figures as can be secured, and should be employed with a *proviso* on which our author is careful to insist.

The book is divided into two main parts. In the first the author describes the origin and the actual state of the social question in Spain. In three chapters the general characteristics of the labour movement in that country, the condition of the proletariat in the different industrial centres, and its condition through the countryside in those agricultural occupations to which the great bulk of the nation is devoted, are presented and examined. The second portion of the work deals with various reforms and movements, the aim of which is either the complete solution of the social question, or at any rate some mitigation of its gravity. Individual or combined effort in independence of any action by the State is first investigated, and then our author turns to the policy pursued in this connection by the Government. Here, too, his attention is necessarily given in the main to what has been done, or is contemplated, to improve the economic status of the agricultural proletariat. For Spain is still preponderantly agricultural; and there is obviously large room for great amelioration in this department of her business activity. In many respects she is still, it is plain, at a low stage of development when compared with other European countries.

It is not, it must be admitted, a cheerful picture which our author is compelled to draw. The poverty of the masses of the people might even provoke a feeling of positive despair. While the work-

man seems, in consequence of an Oriental nonchalance contracted perhaps, as M. Marvaud hints, from the Moors who once governed the country, to feel these narrow means less keenly than his fellows who belong to other nationalities, and to be incapable of that disciplined combination which in England would seek and obtain effective help from trades unions, and in Germany would rely on the active pressure of social democracy, the Spaniard nevertheless passes with suddenness from acquiescent apathy to combative excitement; and it is the aggressive type of modern Socialism, known as Syndicalism, which is most commonly in evidence in the Peninsula. Another salient characteristic is brought out in the careful description which is given of the Institute of Social Reforms, located in the capital, and of the legislation it has conceived and passed. On paper these laws are excellent. The scheme is even more drastic on some points, such as the protection of women from industrial labour after childbirth, than the laws of other countries. Nor does it fail in comprehensiveness. And yet it would appear to be in actual fact a dead letter. But the crux of the economic situation in Spain is found, as we have noticed, in agricultural rather than in industrial life. A different problem is presented in various portions of the country. In some districts the large estates need to be broken up, while in others the excessive subdivision of the ownership and occupancy of the soil calls for some restraint. In most parts systematic irrigation offers hope of material improvement. In all the means of communication are still very backward. When to this we add that a large proportion of the lower classes of the population is illiterate, and that with many of the middle classes, whom our author excludes expressly from his purview, from considerations of space, the problem of effecting a balance between an inadequate income and an absolutely necessary expenditure is in the generality of years no less insoluble than it would seem to be with their inferiors, we must conclude that here, at any rate, there is no lack of material for the economist to investigate in the desire to find an opportunity, or to suggest and employ means, for alleviating in some degree such prevailing misery, if a complete cure cannot be at once discovered or effectively applied.

L.L.P.

10.—*An Empire in Pawn: being Lectures and Essays on Indian, Colonial, and Domestic Finance, Preference, Free Trade, &c.* By A. J. Wilson. 336 pp., 8vo. London: T. Fisher Unwin, 1909. Price 10s. 6d. net.

This collection of writings produced at various times during the last quarter of a century suffers in a measure from a disadvantage which often attaches to volumes thus compiled. But the disadvantage is here neutralised to some extent by the attitude of the writer. He himself admits in his Introduction that in "some of these reprinted essays the statistics are old in a sense;" and, in the case of those dealing with Australasia, which, like many others in the book, are articles reproduced from the "Investors' Review," he confesses that the subsequent "course of events has not been such as" he "anticipated." Yet in this instance, while, as he allows, he seems to have been "wrong" in regarding any step towards

Federation in that quarter of the Empire, whose indebtedness is his theme, as "premature," he thinks that its achievement has involved unnecessary additional expenditure. And the "immediate collapse," which he then expected from the "reckless" finance of these Colonies, was, he now considers, only postponed through the mischievous "power of credit to sustain young communities in a dangerous course." "The borrowing passion," which has since been unabated, must in the end, he still feels convinced, result in the ruin which has thus been deferred rather than prevented. Similarly, in the group of Essays on the fiscal controversy, he has, he tells us, made a selection of a few from many articles, because he is sensible that the "mockery and derision," which was all that he could bring himself to bestow at first upon such "fantastic proposals," might properly be regarded as "ephemeral writing;" and he himself has gradually come to the conclusion that "there was a force behind the Protectionists greater than any argument or sophistication of statistics could furnish." In other words, as an Essay written as recently as 1905 indicates, he shares the idea of observers of a very different fiscal creed who hold that "revenue considerations" may compel the abandonment in this country of the Free Trade principle of taxing "for revenue alone." The real cause of this result, in which Mr. Wilson despondently acquiesces rather than finds any cause for satisfaction, is closely connected with the text on which he is never weary of discoursing. It is excessive expenditure with its inevitable sequel, financial embarrassment.

In the opening sentences of his Introduction he states concisely the moral enforced throughout his writings; and he is correct in pleading that, if his figures be old, his argument has not yet become obsolete. It is this connecting thread which gives to the collection of essays, lectures and articles a sense of unity; and the emphatic expression and firm grasp of his belief, which characterises the author, sustains the interest of the reader through the discussion of the various topics set forth in the title of the book. "My contention," Mr. Wilson states, "has always been a simple one." It is that "debt is a cancerous disease and morally deadly in the course of time alike for the nation and the individual." And, he proceeds, "inasmuch as the age in which we live is distinguished above all that have gone before it as the age of credit, which means debt, it follows that our peril is the greatest ever seen, and it grows in intensity—the peril to our civilisation" and our "liberties." In India, in Australia, and even in Canada, warning illustrations of the presence of this potent mischief are discovered. The appreciative essay on Mr. Gladstone, and the informed and informing lecture on "some aspects of modern banking," fulfil indeed the subordinate purpose of throwing into relief the main object Mr. Wilson has in view; and, while in an interesting discussion of the "ethics of gambling," he tries to discriminate between deserved and unmerited reproach, he has little but damaging criticism to bestow in another essay on most of the component members of the class of "professional directors," and for Rhodesian finance he has nothing but outspoken blame in a third batch of articles.

It is difficult to avoid an impression that the colours are laid on with too thick and full a brush, although much that is said is as pertinent as it is true. Of their forcible lucidity indeed no reader of these essays can entertain a doubt. But for charity to adversaries, or for suspense of judgment, or perhaps even for a hint of reservation, we should propably seek in vain in these animated chapters, and, if we accepted in their fulness the prophecies of impending woe uttered on nearly every page, our hopes for the future of mankind upon this planet would be wrapped in the gloom of unrelieved disillusion. We should, nevertheless, do well to weigh with care the serious arguments advanced by so convinced and persuasive and experienced an authority. L.L.P.

11.—Other New Publications.*

[These notes do not preclude a fuller review in a later issue of the Journal.]

Andersson (Thor). Statistikens Själfständighedsförklaring i Sverige. 80 pp., 8vo. Stockholm : Fröleen and Co., 1910.

[A pamphlet advocating "the independence of Swedish statistics," and severely criticising certain Swedish statisticians.]

Benini (Rodolfo). La Semiologia economica a base statistica. 16 pp., 8vo. Rome : G. Bertero and Co., 1910.

Best (R. H.), Davies (W. J.) and Perks (C.). Brassworkers of Berlin and of Birmingham. A comparison. Joint Report of. 5th edition. xi + 82 pp., 8vo. London : P. S. King and Son, 1910. Price 6d.

[An interesting and painstaking account, devoid of political bias.]

Butler (Elizabeth B.). Russell Sage Foundation. Women and the trades. Pittsburgh, 1907-08. The Pittsburgh Survey findings in six volumes, edited by Paul Underwood Kellogg. 8vo. New York, 1909.

Chailley (Joseph). Administrative problems of British India. Translated by Sir William Meyer, K.C.I.E. xv + 590 pp., 8vo. London : Macmillan and Co., 1910. Price 10s.

[This book, the result of many years of labour, is divided into two parts, the first dealing with British administration and the second with British policy in India. The author deals, among other subjects, with the populations of India, their languages and races, their religions, castes and occupations, the economic conditions of the country, social and political reforms, and the social relations between Europeans and Indians. In the second division of the book the native States of India and Burma are described, while there are also chapters dealing with landed property and the agricultural classes, law, justice, education, and the share of the Indians in the administration of the country.]

Cruppi (Jean). Pour l'expansion économique de la France. Dix-neuf mois au Ministère du Commerce et de l'Industrie. 391 pp., sm. 8vo. Paris : P.-V. Stock, 1910. Price 3 frs. 50 c.

[In this volume M. Cruppi, formerly Minister of Commerce and Industry, deals with different economic and commercial subjects which came within his observation when at the Ministry. He suggests reforms in certain directions, more especially in regard to the French mercantile marine, technical instruction, and the French customs tariff. The book embodies a number of speeches on commercial topics.]

* See also "Additions to the Library," page 681, *sqq.*

Davenport (C. B.). Eugenics. The science of human improvement by better breeding. 35 pp., 12mo. New York: Henry Holt and Co., and London: G. Bell and Sons, 1910. Price 2s.

[A brief statement of the present condition of our knowledge of the inheritance of various characteristics, which it is possible now to formulate more precisely, owing to recent developments in the study of Mendelism.]

Dawson (William Harbutt). The vagrancy problem. The case for measures of restraint for tramps, loafers, and unemployables: with a study of Continental detention colonies and labour houses. xv + 270 pp., sm. 8vo. London: P. S. King and Son, 1910. Price 5s.

[The intention of the author is to educate public opinion still further on the rational treatment of the vagrancy question. There are some interesting tables summarising the results of measures dealing with vagrancy in Belgium, Germany and Switzerland.]

Denis (H.) and Denis (Madame H.). Atlas de statistique économique, financière et sociale de la Belgique comparée aux autres pays. (atlas of statistical charts and diagrams.) La. 4to. 1908.

Joly (Henri). Problèmes de science criminelle. 291 pp., 8vo. Paris: Hachette et Cie., 1910. Price 3 frs. 50 c.

[The author considers his subject under four heads, namely, crime at the present time, the penal question and capital punishment, the penitentiary question, and means of assistance and of repression. In the first part the increase of crime, and especially of juvenile crime, as well as the difficulties arising out of statistical comparisons as to the degree of criminality in different countries, are discussed.]

Loch (C. S.). Charity and social life. A short study of religious and social thought in relation to charitable methods and institutions. 496 pp., 8vo. London: Macmillan and Co., 1910. Price 6s. net.

[A reprint for the most part from the *Encyclopædia Britannica*, with additional chapters on charity in relation to the growth of religious thought, and on questions raised by the Royal Commission on the Poor Laws. The author does not deal with recent charitable schemes and proposals, and the book is more a study of charity in relation to the thoughts with which it is most closely associated and some of the methods to which it has given force and vitality.]

Lottin (Joseph). Le Calcul des probabilités et les régularités statistiques. 32 pp., 8vo. Louvain, 1910.

Oakenfall (J. C.). Brazil in 1910. (Edited by the Commission of Economic Expansion of Brazil, Paris.) 280 pp., 8vo. Plymouth, 1910.

[A brief general description of the social and economic condition of Brazil at the present time. The appendix contains statistics of wages and the cost of living in Rio de Janeiro, &c.]

Pratt (Edwin A.). Canals and Traders. The argument pictorial as applied to the Report of the Royal Commission on Canals and Waterways. xi + 123 pp., maps, &c., 8vo. London: P. S. King and Son, 1910. Price 1s.

[The object of this book is to examine the Report of the Royal Commission on Canals, and to show the impracticability of the scheme of "State-aided canal resuscitation" proposed by the majority of the Commissioners. There are numerous reproductions of photographs by which the author illustrates the actual conditions existing on our waterways.]

Vogelstein (Theodor). Organisationsformen der Eisenindustrie und Textilindustrie in England und Amerika. xv + 277 pp., 8vo. Leipzig: Duncker and Humblot, 1910. Price 6 marks 50 pf.

[An economic and statistical study of the organisation and development of the iron and textile industries in England and in the United States. There is a statistical supplement dealing principally with prices and production of iron manufactures in the two countries for a series of years.]

Webb (M. de P.). The rupee problem, a plea for a definite currency policy for India. 51 pp., 8vo. Karachi: The "Mercantile" Steam Press. 1910. Price 1 rupee.

[This pamphlet deals with the condition of the currency in India and the present rise in prices. The author urges the more equitable and scientific management of the Indian currency.]

Women in industry from seven points of view. By Gertrude M. Tuckwell, Constance Smith, Mary R. Macarthur, May Tennant, Nettie Adler, Adelaide M. Anderson, and Clementina Black; with a preface by D. J. Shackleton, M.P. xiv + 217 pp., 8vo. London: Duckworth and Co. 1910. Price 2s. net.

[This volume is a reprint of the book issued in 1908, and is intended for the public interested in the general question of woman's position in industry. The papers deal, among other subjects, with the *minimum* wage, trade unionism, infant mortality, child employment, and factory and workshop law.]

Austria. Statistische Monatschrift, April, 1910. (Contains) Beiträge zur Statistik der Jagd. Von Dr. Hugo Forcher. La. 8vo. Brünn: F. Irrgang, 1910.

[An interesting and unusual statistical study of sport in Austria in 1908 and in earlier years. Statistics are given of the areas of forests and woodlands and of game preserves in the different divisions of the Kingdom. The numbers of the different kinds of animals and birds killed are given in great detail as regards time and place. A section of the book deals with the imports and exports of game of various kinds, in regard to different countries for a series of years, and there are also statistics of the consumption and of prices of game in certain large towns. The author, in conclusion, offers some suggestions as to the improvement of the statistics of sport, and for this purpose he has drawn up a *questionnaire*.]

CURRENT NOTES.

At the Ordinary Meeting of the Society on May 24 the President, Sir J. Athelstane Baines, in referring to the death of His Majesty King Edward VII, said that much of the work done by his late Majesty, perhaps that of the most importance, could not be known for many years, and must await the verdict of history. But the high qualities which formed a link between the life of King Edward and the work and objects of the Society were those which above all others had been fully recognised by the public, in the Press and otherwise, because they were those which more than any others bound him to the hearts of his subjects; these were, his thoughtful initiative and unswerving sympathy with projects of social improvement and measures for bettering the conditions of every class in this country. To use a familiar expression, his heart was in the right place; and he had the brain to direct the beneficent impulses of his heart into the channels in which they would be of the most practical and permanent benefit to his people.

Without saying more, he would now ask the Honorary Secretary to read the Address which the Council had thought it their duty to present to his successor, His Gracious Majesty King George V, and he would assume that, by their standing to listen to it, the Fellows would be taken as adopting it as the expression of their views as well as those of their officials.

Mr. R. H. Rew, Honorary Secretary, then read the following Address:—

“ TO THE KING’S MOST EXCELLENT MAJESTY :

“ MAY IT PLEASE YOUR MAJESTY,

“ We, the President and Council representing the general body of Fellows of the Royal Statistical Society, humbly approach Your Majesty with an assurance of our loyal attachment to Your Majesty’s Throne and Person, and of our most respectful condolence with Your Majesty and the Royal Family on the sorrowful occasion of the death of our beloved Sovereign His Majesty King Edward. We desire humbly to express the profound grief which we, in common with our fellow-subjects throughout the Empire, feel in the loss of a Sovereign whose life was devoted to the furtherance of the welfare of His People, and whose reign will be ever memorable in the history of the British race.

“ The Royal Statistical Society recalls with grateful pride that

His late Majesty was graciously pleased as Prince of Wales to occupy for nearly thirty years the position of Honorary President of the Society, and that during the whole of his reign He was its Patron.

"We desire to present our respectful and dutiful congratulations to Your Majesty on your accession, and to express our gratitude for the interest which Your Majesty has graciously shown in the affairs of the Royal Statistical Society and the progress of statistical knowledge. For the last nine years Your Majesty has been Honorary President of the Society, and we remember with special appreciation Your Majesty's participation in the reception by the Society of the International Statistical Institute in London in 1905, and of the inspiring address delivered by Your Majesty, as Honorary President, on that occasion. We venture to express the hope that the Society may continue to merit and receive Your Majesty's gracious patronage.

"We earnestly pray that the favour of Heaven may rest on Your Majesty and Your Royal Consort, and that it may please Almighty God to vouchsafe to Your Majesty a long, peaceful and beneficent reign over the populations and territories united in allegiance to the British Crown.

"Given under the Common Seal of the Royal Statistical Society, May 24, 1910."

One of the most important influences of the last month has been the collection of the overdue taxes. The amount of the overdue taxes was stated by the Chancellor of the Exchequer to reach about 29,000,000*l.*, and immediately the Budget was passed some uneasiness arose as to the effect upon the London money market of the collection of this great sum of money in the course of a few weeks. Consequently suggestions were made that the Treasury should purchase in advance of maturity a portion of the Treasury Bills issued to finance the Exchequer until the revenue was received. This suggestion received very careful attention, but unfortunately the law did not permit it to be carried out. The Treasury has power to make regulations for the issue and redemption of Treasury Bills, but these regulations have to be submitted to Parliament for approval, and inasmuch as the Treasury has never before been in the position of possessing a vast sum of money which it could not disburse either in supply or in the redemption of Treasury Bills at their due date of maturity, no regulation has ever been made for the purchase of Treasury Bills in anticipation of their maturity. Hence it was impossible for the Treasury to act upon the suggestion. The result has been that the Government balances

in the Bank of England have grown at a very rapid rate. Whereas at the end of April the public deposits in the Bank of England were only 8,444,000*l.*, on June 8 they reached 24,931,000*l.* There remains about 13,000,000*l.* of overdue taxation to be received. As the Treasury itself could not furnish assistance to the money market in meeting the tax collections other expedients had to be adopted, and everyone has endeavoured to the best of his ability to assist matters. The joint stock banks have permitted their balances in the Bank of England to fall to a relatively low figure, and of the 16,500,000*l.* that has accumulated in the Bank of England to the credit of the Treasury, 6,000,000*l.* has come from bankers' balances with the Bank of England. The Bank of England has also come to the assistance of the market, and has in a measure taken the place of the Treasury by buying Treasury Bills and holding them until they mature. So far the Bank has bought about 3,300,000*l.* of Bills. Of the balance of the money, over 5,000,000*l.* has been received by the market in notes and gold either from the country or from abroad—most of it from the United States; and the sum which the market has been obliged to borrow from the Bank of England at Bank Rate or over only slightly exceeds 3,000,000*l.* The effect of the collection of the taxes has, however, been felt in other directions more than in the discount and short loan markets. In anticipation of the collections, bankers were not willing to lend money freely, and the influence of their action was immediately felt in what may be termed the market for capital in contra-distinction to bankers' money, and the subscriptions for new issues began to decline. The result has been that, in the last six weeks, the number of new issues of capital has been on a small scale in comparison with the issues in the first four months of the year, and the number of new applications for capital is expected to remain small until the Government balances are released by the redemption of Treasury Bills and by payments for interest and supply in July. The revenue collections in London have also to some extent disturbed the other international money markets, and the new issues of capital in New York, Paris and Berlin have greatly declined.

The 4 per cent. Bank of England rate, combined with the Bank's control of the open market, has caused gold to come to London in considerable quantities from other lands, and the Bank of England's stock of gold and cash reserves have now been raised to larger figures than have been witnessed since the phenomenal accumulation of gold in London in 1895 and 1896. The consequence has been that the Bank of England in two weeks in succession reduced its

official *minimum*, on the first occasion from 4 per cent. to $3\frac{1}{2}$ per cent., and on the second to 3 per cent. A further reduction is not expected to take place, although fresh additions may be made to the stock of gold in the Bank of England. It is recognised that the gold accumulated may rapidly disappear when the Bank loses control of the open market and the joint stock banks have the loaning of the large amount of gold that has recently been sent to London.

Early in June a relatively great fall occurred in the prices of American railway securities in consequence of the issue of an injunction granted to the Attorney-General of the United States restraining the Western railways from increasing their freight rates. The fall extended to American Industrials. Subsequent events have shown that the trouble was really a misunderstanding, and that all that was needed to put matters right was an exchange of views. In consequence of the semi-panic in the security market and the spread of rumours concerning the inability of railways to meet their charges if the advance in freight rates were not permitted, the Presidents of all the Western roads visited President Taft at Washington for the purpose of laying their views before him. The result of the interview was entirely favourable, both to the Government and to the railways. The railway Presidents explained that the increase in rates was absolutely essential, having regard to the advances in wages that had been necessary (owing to the rise in the cost of living), many of which had been granted by the arbitrators appointed under the Arbitration Law, and that if the railways were not allowed to charge increased rates for the carriage of freight, their profits would seriously decline owing not only to the advance in wages, but to the high prices of materials. On the other hand, President Taft and his Ministers were able to convince the representatives of the railways that the injunction was not intended to prevent an advance in rates. It was merely intended to compel the railways to comply with the law and to submit the proposed increases to the decision of the Interstate Commerce Commission. Further, the President suggested to the railways the advisability of not asking for an increase in rates until after the passage of the new Railway Bill now before Congress, which gives power to the Interstate Commerce Commission to inquire into the reasonableness of any increase in rates without the intervention of aggrieved parties. At the moment of writing, the prices of American railway securities have somewhat recovered in the expectation that the Railway Bill will soon become law, that the matter will go before the Interstate Commerce Commissioners,

and that the railways will be permitted to increase their rates sufficiently to cover the rise in wages and the increased cost of materials.

Mr. Sauerbeck's index-number of prices for May is 78·2, the average of the eleven years 1867-77 being taken as 100. Although the aggregate index-number shows little change and is only slightly lower, there were some very important changes which practically balanced each other. A considerable fall took place in corn, and a more than equivalent rise in meat, both beef and mutton. There is no alteration to record in minerals, and very little in the case of textiles, but among "sundry materials" there is a reduction for linseed oil and palm oil. Articles of food were 75·5 as against 75·4 in April, while materials were 80·2 as against 80·8. The price of silver fell slightly.

The trade returns for May, as will be seen from the subjoined tables, give evidence of continued progress, both as regards imports and exports, although the month contained one working day less than the corresponding month last year, owing to the funeral of the late King. Allowance should, however, be made for higher prices.

Shipping (foreign trade).	May, 1910.	Increase (+) or decrease (—) in May, 1910, as compared with May, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	3,607,832	+ 539,544
Total, British and foreign, <i>cleared</i> } with cargoes	4,782,523	— 137,627

Imports.	May, 1910.	Increase (+) in May, 1910, compared with May, 1909.
Imports, value c.i.f.—	£	£
I. Food, drink and tobacco	21,606,590	+ 4,082,958
II. Raw materials and articles } mainly unmanufactured	19,980,381	+ 4,758,627
III. Articles wholly or mainly } manufactured	13,476,908	+ 1,552,102
IV. Miscellaneous and unclassi- } fied (including parcel post)	205,300	+ 20,944
Total merchandise	55,269,179	+ 10,414,631
Imports of bullion and specie	9,603,726	+ 5,221,577

Exports.	May, 1910.	Increase (+) or decrease (—) in May, 1910, compared with May, 1909.
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£
I. Food, drink and tobacco	1,775,781	+ 82,311
II. Raw materials and articles mainly unmanufactured	4,523,252	+ 40,307
III. Articles wholly or mainly manufactured	26,627,679	+ 3,784,032
IV. Miscellaneous and unclassi- fied (including parcel post)	680,599	+ 174,915
Exports of foreign and colonial merchandise, value f.o.b.—		
I. Food, drink and tobacco	1,004,559	+ 42,196
II. Raw materials and articles mainly unmanufactured	5,299,473	+ 1,023,963
III. Articles wholly or mainly manufactured	1,977,830	— 19,472
IV. Miscellaneous and unclassi- fied (including parcel post)	12,400	— 3,673
Total, British, foreign and colonial	41,901,573	+ 5,124,579
Exports of bullion and specie	5,358,587	+ 810,073

Volume I of the "Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Possessions, 1909," has just been issued. In accordance with the recommendation of the Departmental Committee on Trade Records, the arrangement of these volumes has been altered. The present volume contains the tables of imports classified according to countries of consignment, and exports classified according to countries of final destination. Volume II will contain abstract and detailed tables of imports from and exports to each country, and the quantities (where recorded) and value of principal and other articles retained in the United Kingdom; abstract and detailed tables of imports and exports at each port; the amount of customs revenue received at each port or place; details of the transshipment under bond of certain articles; an account of the quantities of articles liable to customs duties remaining in bond; and details of the transshipment of free goods on through bills of lading. Volume III will contain a classification, on the basis followed in Volumes I and II of the annual statement for 1908 and earlier years.

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending May 28, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth-rates.	Mean Death-rates from all causes.
		Births.	Deaths.		
England and Wales (77 great towns).....	16,940,895	33,666	16,925	25·9	13·0
Scotland (8 principal towns)	1,891,936	3,863	2,187	26·6	15·1
Ireland (Dublin registration area and 21 urban districts)	1,151,790	2,514	1,812	28·4	20·5

There are no very marked differences between the rates given above and the rates for the corresponding weeks last year, or for the four preceding weeks. The birth-rates, however, both for England and Ireland, show a decided rise in the last week. In England the rate was 31·01, in Ireland 32·9; the lowest rates during the four weeks were 17·1 in England and 22·7 in Ireland.

According to the Board of Trade *Labour Gazette*, the state of the labour market in April was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
April, 1910	416	699,932	30,475	4·4
March, 1910	416	701,766	36,543	5·2
April, 1909	416	700,867	57,250	8·2

Employment in April continued to improve generally. As compared with a year ago, employment in all industries, except cotton, showed considerable improvement.

The following returns relating to pauperism, from data supplied by the Local Government Board, in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for May, 1910:—

Selected urban districts.	Paupers on one day in the second week of April, 1910.				Decrease (—) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	80,083	43,089	123,172	256	— 5	— 5
West Ham	5,172	11,429	16,601	214	— 8	— 6
Other districts	73,120	122,275	195,395	207	— 6	— 6
Scotland	11,051	35,355	46,406	217	— 5	— 3
Ireland	15,409	12,441	27,850	248	— 12	— 5
Total, April, } 1910	184,835	224,589	409,424	224	— 6	— 5

The third part of the Preliminary Tables of the Census of Production recently issued, deals with a variety of industries, including linen, silk, salt, paint, soaps, candles, and many other commodities. The gross output (selling value or value of work done) is 165,833,000*l.*, and the cost of the materials used is 104,610,000*l.* The amount paid to other firms by the various factories for work given out is 1,402,000*l.* The net output, *i.e.*, the excess of the gross output over the cost of the materials used and the work given out, is 59,821,000*l.* The total of persons employed (except out-workers), is 651,001, and figures are also given of the net output per person employed, excluding out-workers. It should, however, be observed in this connection that the high figures of net output per person, shown for certain groups, result from the inclusion in these groups of a considerable quantity of proprietary articles which involve heavy expenses of sale and advertisement. This is especially the case in the chemical, drug and perfumery trades, the paint, colour and varnish trades, the soap and candle trades, the fertilizer, glue, sheep-dip, and disinfectant trades, and the ink, gum and sealing-wax trades.

The attention of those who are interested in the question of the relative rise in incomes and in wages during recent years may be directed to a long letter on this subject by "A Student of Arithmetic" that appeared in *The Times* of May 23. The writer takes as his text two statements by Viscount Morley and by Mr. Winston Churchill respectively, to the effect that, during the past ten years, the incomes of income-tax payers have increased by about 100*l.* per head, while on the other hand the wages of "the aristocracy of labour" have only risen by 1*l.* per head. These statements do not appear to make any allowance for the considerable

increase that must have taken place in the number of payers of income-tax, and "A Student of Arithmetic," utilising (1) the increase in the number of assessments under Schedules D and E; (2) the increase in the number of claims for abatement; (3) the increase in the number of dwelling houses of over 20*l.* in annual value, suggests that as a fact the increase in number of tax payers has been so great—as much as 200,000—that, when allowance is made for more accurate assessment of profits, it is doubtful if there has been any increase of income per head at all. It seems questionable whether the quantities utilised by "A Student" can be regarded as valid indices to the number of payers of income-tax, but the letter is an interesting one, and the point dealt with is of great importance. Mr. Bowley, it will be remembered, discussed in his Paper on "The improvement of official statistics" (Journal, vol. lxxi., pp. 471-4), a similar newspaper statement respecting the relative rise of incomes and of wages, and indicated the fallacies.

At the March meeting of the *Société de Statistique de Paris*, a Paper was read by M. Lucien March in which the question of the effects of changes in retail prices on the household expenditure of different classes was examined. The data presented related to Paris only, not, as in the recent study of M. Levasseur, to different districts of France. The summary of results is contained in the following series of index numbers:—

	1839-43.	1850-54.	1861-65.	1871-75.	1876-80.	1887-91.	1898-1901.	1907-08.
A.....	86·5	82·0	98·0	113·0	109·5	103·0	100·0	100·0
B.....	85 5	80·0	98·0	112·0	109·0	101·5	100·0	97·0

A. Family of a carpenter, consisting of 4 persons, with an income of 80*l.* per annum.

B. Middle-class family of 9 persons (including 2 domestics) with an income of 800*l.* per annum.

In the latest period shown, the cessation of the octroi on wine entering Paris has kept the figures down. But for this it is estimated that they would have been 104·5 and 101·0 respectively. The expenditures covered by the index number were those on food, heat, light and housing. These would require, apparently, rather over two-thirds of the workman's income, and but little over one-third of that of the middle-class family, at the period to which the figures of 80*l.* and 800*l.* apply, namely, the end of the nineteenth century.

The general complaint of the increase in the cost of living, to which M. March alludes is, he considers, due to an increase in the standard of living. An illustration is afforded by certain data relating to the prices of the dishes in a popular restaurant. From 1868 to 1909 the cost per meal increased 70 per cent. on the average. It is estimated that, had the same articles been consumed throughout, the changes in the prices charged would have led to an increase of 40 per cent. in the cost. The difference represents changes in consumption, a rise in the scale of living. The index numbers of the preceding paragraph represent the changing cost of a uniform scale of living, as far as that could be submitted to estimate. A comparison of these with the changes in earnings or income affords, argues M. March, a measure of the improvement in the scale of living. This is, of course, the correction of wages by a price index to determine what has become familiar under the name of "real wages," as contrasted with "nominal wages." The wages of a carpenter in Paris have, it is stated, doubled between 1842 and 1900, while the cost of a like amount of food and lodging, light and heat, has increased only some 15 per cent. On the other hand, the income of the official class typified by the family whose income at the end of the period was about 800*l.* has only increased by some 25 per cent., while the cost of their food, &c., has grown almost equally with that of the workman. The relative position of the manual worker has thus improved greatly.

A point of considerable interest was, incidentally, submitted to examination, namely, the increase of rents of houses, and their relation to the selling value of house property. It was found that the value of property increased more rapidly than its rental, and that the increase of the latter was more closely related to the increase of wages than to the increase in the prices of commodities in general. Increase of rents has operated to offset the downward tendency in the prices of commodities since the early seventies, though it has not been great enough to prevent the index number of expenditure from falling. The increase of rentals over this later period, too, has been very much more marked in the case of the artisan family than in that of the middle-class household. The net result of the whole investigation is to show a great improvement in the command which the earnings of labour have afforded over such goods as are represented in the index number. This improvement was marked in the first half of the nineteenth century, as shown by data given by M. March, but not cited above, carrying the comparison back to the first decade of the century. Its rate was conspicuously increased about the middle of the century, and that increased rate has been maintained with but little variation since that time.

In the May issue of the *Journal de la Société de Statistique de Paris*, Dr. Jacques Bertillon discusses the comparative statistics of alcoholism and tuberculosis in France. The conclusion at which the writer arrives is that the principal factor in the cause of tuberculosis is the consumption of brandy. He demonstrates, in an interesting diagram, that the consumption of brandy begins where the production of wine ceases, namely, in the departments of the North; and it is certainly remarkable that in a corresponding diagram the deaths from phthisis in the departments of the North and the East are overwhelmingly in excess of those of the South and the Midi. The argument is strengthened by the figures quoted of deaths from tuberculosis among classes specially exposed to the temptation of brandy-drinking, such as the "cabaretiers." Further, it is pointed out that tuberculosis tends to attack men rather than women in adult life, since the latter are seldom addicted to the habit of drinking brandy, while up to the age of fifteen both sexes are liable to tuberculosis in about the same degree. Dr. Bertillon advocates the encouragement of wine-drinking to combat the evil; wine is, in this respect, "l'ennemi de l'eau de vie," and therefore not the ally of tuberculosis.

It is announced that arrangements are being made for the appointment of a Statistical Officer to the Port of London Authority. Personal experience of the work and management of a statistical department is a necessary qualification. The officer will be expected to give his whole time to the service of the Authority. The salary attached to the position will be 600*l.* per annum.

The Census Bills for Great Britain and Ireland respectively were read a second time in the House of Commons on June 14.

Dr. Gustav Sundbärg has been appointed Professor of Statistics at the University of Upsala, and has, in consequence, retired from his office of Superintendent of the Central Statistical Bureau of Sweden.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

The Accountant, 1910—

May 7—Building societies: *Wallace (D. E.)*.

May 14—The rights and duties of executors, trustees, and administrators: *Wilson (Ernest)*.

May 21—The rise and growth of modern industrial capital: *Hamilton (W. R.)*.

May 28—Arbitration and awards: *Singleton (J. E.)*.

Accountants' Magazine. June, 1910—Responsibility of trustees: *Carmon (John)*.

Banker's Magazine. June, 1910—New stamp duties. The new death duties. Progress of banking in Great Britain and Ireland during 1909. No. 5. Proportion of capital and reserve to deposits. The inquiry into the causes of the rise in food prices in India: *Murray (Reginald)*. Revolutionary budgeteering: *Lawson (W. R.)*. Irish banking statistics.

Financial Review of Reviews. June, 1910—Don't pay income tax on savings. You can legally exempt them: *Lowenfeld (Henry)*. The rubber madness in the City:—i. The gamble in shares: *Lawson (W. R.)*. ii. The risks and dangers of rubber cultivation: *Reid (T. H.)*. iii. The possibility of artificial rubber: *Hennings (C. R.)*. The future of the shipping industry: *Fremantle (The Hon. Sir Edmund)*.

Journal of the Board of Agriculture. May, 1910—The conservation of the fertility of the soil: *Hall (A. D.)*. Co-operative agricultural societies in the United Kingdom.

Journal of the Department of Agriculture and Technical Instruction for Ireland. April, 1910—The dead meat trade. The Irish butter industry. Irish butter and the Reichert-Wollny standard: *Brownlee (G.)*. Tobacco growing in Ireland: *Keller (G. N.)*. Some features of Bavarian forestry: *Forbes (A. C.)*. Notes on a visit to Denmark: *McCluskey (T.)*. State-aid to agriculture in Switzerland. Egg records for the year 1908-09. Winter egg records.

Journal of Institute of Bankers. June, 1910—Report of the Council and proceedings at the Annual General Meeting. Overdrafts of local authorities: *Scholefield (Joshua)*.

Journal of the Society of Comparative Legislation. No. 22. April, 1910—The unification of law: *Kennedy (Rt. Hon. Lord Justice)*. The death of Lombroso: *Kenny (Prof. Courtney)*. The history and present condition of the German divorce law: *Schuster (Dr. Ernest J.)*. Codification in the Philippines: *Lobingier (Charles S.)*. Espionage and scientific invention: *Bentwich (Norman)*. French law within the British Empire. III: *Renton (Justice Wood)*. History of the Roman-Dutch law: *Lee (Prof. R. W.)*. Review of legislation, 1908.

UNITED KINGDOM—*Contd.*

- United Empire: The Royal Colonial Institute Journal.* June, 1910—German Colonies in 1909: *Hamilton (Louis)*. Education and anthropology in West Africa: *Tremearne (A. J. N.)*. Dairying in Australia: *Gullett (Harry S.)*.
Surveyors' Institution. Transactions. Session 1909-10. Vol. 42, Part 10—Road construction and maintenance: *Grantham (R. F.)*. Additional remarks on road maintenance: *Menzies (William)*.

UNITED STATES—

- American Statistical Association. Quarterly Publications.* No. 89. March, 1910—The findings of the Massachusetts commission on old age pensions: *Baldwin (F. Spencer)*. Professor Fisher's formula for estimating the velocity of the circulation of money: *Kinley (David)*. Proceedings of the seventy-first Annual General Meeting of the American Statistical Association, New York, December 27-30, 1909. The outlook for American statistics: *Willeox (Walter F.)*. Changes in census methods for the census of 1910: *Durand (Hon. E. Dana)*. The statistical basis of budget-making: *Metz (Herman A.)*.
Bankers' Magazine (New York). May, 1910—The United States Treasury. V: *Smith (William Henry)*. Resources and liabilities: The problem facing the savings bank trustee: *Rhoades (John Harsen)*. Bank examinations analysed: *Reihl (Charles W.)*.
Bulletin of the Bureau of Labor. No. 84. September, 1909—Accidents to railroad employees in New Jersey, 1888 to 1907: *Crum (Frederick S.)*. The Minnesota iron ranges: *Virtue (G. O.)*.
Journal of Political Economy. May, 1910—The prices of American stocks, 1890-1909: *Mitchell (Wesley C.)*. The Illinois water-power scheme: *Moulton (H. G.)*. Consolidation of public utilities in Ohio: *Sidlo (T. L.)*. Political consistency and the cost of living: *Lauck (W. Jett)*. A new cost of living inquiry.
Quarterly Journal of Economics. May, 1910—The separation of state and local revenues: *Bullock (Charles J.)*. The subjective element in the first principles of taxation: *Edgeworth (F. Y.)*. Control of railroad accounts in leading European countries: *Sakolski (A. M.)*. Small holdings and agricultural co-operation in England: *Fay (C. R.)*. Present work and present wages: *Thompson (J. G.)*. Some recent books on protective tariffs: *Robinson (Edward Van Dyke)*. The Cleveland street railway settlement: *Bemis (Edward W.)*. Recent changes in Australasian laws against strikes: *Clark (Victor S.)*. The decline in trade union membership: *Parker (C. H.)*. An American experiment in workmen's insurance: *Bushnell (Henry Davis)*. The British minimum wages act, 1909: *Holcombe (A. N.)*.
Yale Review. May, 1910—The holding corporation. II: *Robinson (Maurice H.)*. Victorian wages boards and the New Zealand Conciliation-Arbitration Act: *Kennaday (Paul)*. Legal limitations upon interference with the contract rights of a competitor: *Trowbridge (Mason)*. Some immigration differences: *Fairchild (Henry Pratt)*.

EGYPT—

L'Égypte Contemporaine, 1910—

No. 2. *March*—Les syndicats agricoles en Égypte: *Nubar (S. E. Boghos Pacha)*. L'industrie sucrière et la culture de la canne à sucre en Égypte: *Artaud (C.)*. Le désastre cotonnier de 1909 et ses causes: *Sékaly (A.)*. Le coton, son influence sur la prospérité générale de l'Égypte: *Lumbroso (J.)*. The demand for the Egyptian cotton: *Todd (J. A.)*. Le commerce extérieur de l'Égypte en 1909. Notes on the industries of Assiut made during June-July, 1909: *Ablett (Norman L.)*.

No. 3. *May*—Projet d'assurance mutuelle obligatoire contre la mortalité du bétail en Égypte: *Piot (J. B.)*. Note sur la première co-opérative de crédit fondée en Égypte: *Loutfy (Omar)*. L'industrie cotonnière russe et l'emploi du coton égyptien en Russie: *Michel (B.)*. Les progrès de l'agriculture en France depuis cinquante ans (suite et fins): *Martin (G.)*. La fabrication des engrais au Caire: *Parodi (H. D.)*. Des aptitudes artistiques des Égyptiens d'après les résultats obtenus à l'École des beaux-arts: *Laplagne (G.)*. Le marché égyptien et l'utilité de la publication des mercuriales: *Martin (Germain)* et *Levi (G.)*.

FRANCE—

Journal des Économistes. *May*, 1910—La politique contre les vérités économiques: *Guyot (Yves)*. Les théories nouvelles sur le commerce au xviii^e siècle: *Levasseur (E.)*. Le langage économique: *Carlile (W. Warrant)*. Un coup d'œil sur nos finances départementales et communales: *Goy (Louis de)*. La banque d'émission hongroise: *Aberdam (Simon)*. Mouvement agricole: *Molinari (Maurice de)*. Revue des principales publications économiques françaises et étrangères: *Rouxel (M.)* et *Breton (Réne)*. Nécrologie: Sir Robert Giffen.

Journal de la Société de Statistique de Paris. *May*, 1910—Statistique quinquennale de l'instruction primaire: *Levasseur (E.)*. Le trafic du canal allemand des deux-mers: *Meuriot (Paul)*. Statistique comparée de l'alcoolisme et de la tuberculose: *Bertillon (Dr. Jacques)*.

La Réforme Sociale, 1910—

May 16—L'organisation de la charité aux Pays-Bas: *Rivière (Louis)*. Le fonctionnarisme: *Hubert-Valleroux (M.)*. Chronique du mouvement social. Pays de langue anglaise: *Rotours (Baron Jules Angot des)*.

June 1—Le reboisement des montagnes au point de vue social: *Touzaud (Daniel)*. Dépopulation: *Romilly (P. Worms de)*. L'exode rural en Belgique: *Flieberg (Émile)* and *Ulens (Robert)*. L'industrie chimique en Allemagne. Les usines Bayer et Cie, leur organisation technique et sociale: *D'Assignies (J.)*. Chronique du mouvement social. Italie et Espagne: *Lepelletier (J.)*.

GERMANY—

Archiv für Rassen- und Gesellschafts-Biologie. March-April, 1910—Die Laichwanderungen der Fische. Ein Beitrag zur Gesellschaftsbiologie der Tiere: *Franz (Dr. Victor)*. Weitere Beiträge zur Theorie der Vererbung: *Weinberg (Dr. W.)*. Zur Beeinträchtigung der Kriegstüchtigkeit in Deutschland: *Fischer (Dr. A.)*. Die Einwände gegen die Anschauung von der fortschreitenden Entartung der Kulturvölker: *Claassen (Dr. Walter)*. Die Bekämpfung der Kindersterblichkeit vom Rassenstandpunkt: *Grassl (Dr. J.)*. Zur Evolution der menschlichen Familie: *Fehlinger (Dr. Hans)*.

Deutsches Statistisches Zentralblatt. May, 1910—Über Mediane und Quartilen: *Kieseritzky (Dr.)*.

Jahrbücher für Nationalökonomie und Statistik (Conrad's). May, 1910—Landwirtschaftliche Kreditreform und innere Kolonisation unter besonderer Berücksichtigung des Vorgehens der Ostpreussischen Landschaft: *Gerlach (Otto)*. Die wirtschaftliche Gesetzgebung des Deutschen Reiches im Jahre 1909. Die Entwicklung des Preisniveaus und des Getreidebedarfs in England und Deutschland in den letzten Dezennien. Mathematisch-Statistisches zur preussischen Wahlrechtsreform: *Borkiewicz (L.)*.

Vierteljahrshefte zur Statistik des Deutschen Reichs. Heft 2, 1910—Die Finanzen des Reichs und der deutschen Bundesstaaten (1909 und 1907). Krankenversicherung in den Knappschaftskassen und Vereinen 1908. Die Erzeugnisse der Bergwerke, Salinen und Hütten 1909. Vorläufige Mitteilung. Banknoten- und Wechselkurse an der Berliner Börse, 1905-09. Schlachtvieh- und Fleischbeschau 1909. Verkehr im Kaiser Wilhelm-Kanal 1909. Statistik der Inhaber-Schuldverschreibungen der Stadt- und Landgemeinden usw. am 31 Dezember 1909.

Zeitschrift für Socialwissenschaft, 1910. Heft 5—Die voraussichtliche Entwicklung der Volkszahl im Deutschen Reich: *Prinzing (F.)*. Politik und Nationalökonomie IV: *Pohle (L.)*. Beiträge zur Theorie des Kapitalzinses V: *Oswalt (H.)*. Die Verwaltung der Freien Gewerkschaften in Deutschland II: *Schilbbach (Bernhard)*.

ITALY—

Giornale degli Economisti e Rivista di Statistica. February, 1910—Ragioni e limiti (?) dei poteri del Direttore generale delle Ferrovie: *Il Ferroviere*. Il Ministero Sonnino e il disegno di legge sugli zuccheri: *Giretti (E.)*. Il prezzo come strumento di lotta fra organismi: *Sella (E.)*. Le mutue cauzioni fra i funzionari dello stato: *Bonalini-Giovanetti (C.)*. Il velivolo di A. Loria: *Martello (T.)*. Nozioni elementari intorno ad alcune categorie di rapporti statistici: *Mortara (G.)*. Prezzi e consumi: *Gini (C.)*.

Rivista Italiana di Sociologia. March-April, 1910 — Intorno all'istruzione primaria: *Levasseur (E.)*. I presupposti statistici della teoria della cernita naturale: *Gini (C.)*. Sociologia e psicologia: *Bruno (A.)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended June 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

(a) Foreign Countries.

Austria-Hungary—

Hungary. Industrie des moulins des Pays de la Sainte Couronne Hongroise en 1906. Svo. 1909. (The Central Statistical Bureau of Hungary.)

Belgium—

Labour. Rapport relatif à l'exécution de la loi du 24 décembre, 1903, sur la réparation des dommages résultant des accidents du travail pendant les années 1905-08. 4to. 1910. (The Belgian Labour Department.)

France—

Labour. Conseil supérieur du travail. Dix-neuvième session. Novembre 1909. Compte-Rendu. 4to. 1910. (The French Labour Department.)

Germany—

Census. Berufs- und Betriebszählung vom 12. Juni 1907. Berufsstatistik. Abteilung 5. Die Bevölkerung der Bundesstaaten nach Alter: Familienstand und Religionsbekenntnis. 4to. 1910. (The Imperial Statistical Bureau.)

— Berufs- und Betriebszählung vom 12. Juni 1907. Landwirtschaftliche Betriebsstatistik. Teil 2A. Viehstand- Maschinen- Nebengewerbe. Hauptberuf der Betriebsleiter- Weinbau- und Forstbetriebe- Kleinere Verwaltungsbezirke. 4to. 1910. (*Id.*)

Prussia. Finance. Die Schulden der preussischen Städte und der mehr als 10,000 Einwohner zählenden preussischen Landgemeinden nach dem Stande vom 31. März 1906. Teil 1. Einleitung. Teil 2. Tabelle 1: Die von den preussischen Städten und den mehr als 10,000 Einwohner zählenden preussischen Landgemeinden im Rechnungsjahre 1905 erhobenen direkten Gemeindesteuern in Hundertteilen der Staats- und Staatlich veranlagten Steuern. Tabelle 2: Das Vermögen und die Schulden der preussischen Städte und der mehr als 10,000 Einwohner zählenden preussischen Landgemeinden nach dem rechnungsmässigen Stande vom 31. März. 1906. 2 vols. Fol. 1909. (The Royal Prussian Statistical Bureau.)

Verein für Sozialpolitik—

Gemeindefinanzen. Zweiter Band, Zweiter Teil. Die Gemeindefinanzstatistik in Deutschland. Ziele, Wege, Ergebnisse. Von *Dr. Otto Most*. Dritter Teil. Die Entwicklung und die Probleme des Gemeindeabgabewesens in den Städten und grossen Landgemeinden der preussischen Industriebezirke. Von *Dr. Henrich Lückner*. 2 vols. Svo. Leipzig, 1910. (Purchased.)

Verhandlungen des Vereins für Sozialpolitik in Wien, 1909. I. Zum Gedächtnis an Georg Hansen von *G. F. Knapp*. II. Die wirtschaftlichen Unternehmungen der Gemeinden mit Referaten von *C. J. Fuchs*, *P. Mombert*, und *M. Weiss*. III. Die Produktivität der Volkswirtschaft mit Referaten von *E. V. Philippovitch*, *O. Kammerer*, *C. Ballod*, *J. Esslen*, und *Fr. Freiherrn von Wieser*. Mit zahlreichen Schaubildern. Svo. Leipzig, 1910. (*Id.*)

Italy—

Agriculture. Annali di Agricoltura. Alterazioni del Granoturco e loro Proflassi. Conferenza illustrata tenuta nei capiluoghi di Circondario del Bergamasco dal Prof. B. Gosio. Svo. 1909. (The Director-General of Agriculture.)

(a) Foreign Countries—*Contd.***Italy—*Contd.***

Justice. Ministero di Grazia e Giustizia e dei Culti. Ordinamento del Casellario Giudiziale. La. 8vo. 1908. (The Ministry of Justice.)

— Statistica della Criminalità per l'anno 1906. Notizie complementari alla Statistica giudiziaria penale. Fol. 1909. (*Id.*)

Milan. Comune di Milano. Statistica dei Prezzi del frumento, del pane, del vino, delle carni, del burro e del riso in Milano. (Prezzi del frumento dal 1700 al 1908; per gli altri generi dal 1801 al 1908. 13 pp., diagrams, la. 8vo. 1909. (The Municipal Statistical Bureau.)

Turin. La Vita Amministrativa del Comune di Torino nel quinquennio 1903-08. Vol. II, la. 8vo. 1909. (*Id.*)

Consorzio fra la Società Umanitaria e la Camera del Lavoro, Milano. L'Ufficio di consulenza medico-legale nel 1909. 14 pp., 8vo. 1910. (The Society.)

Roumania—

Ministère de l'Industrie et du Commerce. Les Statuts de la Société "Govora-Calmanesti." (Station Balnéaire). Sm. 8vo., 30 pp., 1910. (The Ministry.)

Russia—

Agriculture. Direction générale de l'Organisation agraire et de l'Agriculture. Travaux des Commissions agraires (1907-08). 35 pp., maps, plans, &c., sm. 4to., 1909. (The Board of Agriculture and Fisheries.)

Sweden—

Labour. Statens Förläkningsmäns för medling i arbetstrister verksamhet under åren 1907 och 1908. 8vo. 1910. (The Swedish Labour Department.)

— Redogörelse för Lockouterna och Storstrejken i Sverige. År 1909. Parts i and ii. 2 vols., 8vo. 1910. (*Id.*)

United States—

Bureau of the Census. Special Reports. Statistics of cities having a population of over 30,000: 1907. 4to. 1910. (The Bureau of the Census.)

New York City. Fourth report of the Tenement House Department for the years 1907 and 1908. 8vo. 1909. (The Department.)

(b) India and Colonies.

India, British—

Imperial Library Catalogue. Part 2. Subject-Index to the Author Catalogue. Vol. 1, A-L. 8vo. 1908. (The Government of India Imperial Library.)

Bengal District Gazetteers. Howrah. 8vo. 1909. (The India Office.)

Central Provinces. District Gazetteers. Chanda District. Vol. A. Descriptive. Jubbulpore District. Vol. A. Descriptive. 2 vols. 8vo. 1909. (*Id.*)

Punjab District Gazetteers. Vol. 15B. Ludhiana District and Maler Kotla State. Statistical tables, 1904. Vol. 27B. Jhelum District. Statistical tables, 1904. Vol. 28A. Rawalpindi District, with maps. 1907. 3 vols. 8vo. 1909. (*Id.*)

United Provinces of Agra and Oudh. Vol. 18. Pilibhit. A gazetteer, being vol. 18 of the District Gazetteers. Vol. 21. Banda. A gazetteer, being vol. 21 of the District Gazetteers. 2 vols. 8vo. 1909. (*Id.*)

Canada, Dominion of—

Census of Population and Agriculture of the North-West Provinces. Manitoba, Saskatchewan, Alberta, 1906. 8vo. 1907. (The Census and Statistics Office, Ottawa.)

(c) United Kingdom and its several Divisions.

United Kingdom—

Census of Production (1907). Preliminary Tables summarising the Results of the Returns received under the Census of Production Act, 1906.

Part 1 [Cd-4896], Part 2 [Cd-5005], and Part 3 [Cd-5162], 1910. 3 vols., 1910. (The Director, Census of Production Office.)

(c) United Kingdom and its several Divisions—*Contd.*United Kingdom—*Contd.*

Board of Education. Report on Working of the Education (Provision of Meals) Act, 1906, up to March 31, 1909. [Cd-5131.] 8vo. 1910. (Purchased.)

British Colonies (Legislature). 81. 1910. (*Id.*)

Coroners' Committee. Report of Inquiry into the question of Deaths resulting from the administration of Anæsthetics. [Cd-5111.] 1910. (*Id.*)

New French Customs Tariff. Translation of the French Customs Tariff as amended by the law of March 29, 1910, with a comparison of the new and former rates of duty. [Cd-5127.] 1910. (*Id.*)

England and Wales—

London County Council. General Election of County Councillors, 1910. (Numbers on the register, numbers voting, &c.) No. 1333. 4 pp., 8vo. 1910. (Purchased.)

Birmingham. Health Department. Report on Industrial Employment of Married Women, and Infantile Mortality. 8vo. 1910. (The Medical Officer of Health.)

(d) Authors, &c.

Andersson (*Dr. Thor.*). Statistikens Själfständighets-Förklaring i Sverige. 80 pp., sm. 4to. 1910. (The Author)

Benini (*Rodolfo*). La Semiologia economica a base statistica. 16 pp., 8vo. 1910. (*Id.*)

Best (*R. H.*), Davies (*W. J.*) and Perks (*C.*). Brassworkers of Berlin and of Birmingham. A comparison. Joint report of. 5th edition. xi + 82 pp., 8vo. London, 1910. (Messrs. P. S. King and Son.)

Breton (*J. L.*). Contre la Proportionnelle. Préface de Jules Destrée. 256 pp., sm. 8vo. Paris, 1909. (Messrs. E. Cornély and Co.)

Butler (*Elizabeth B.*). Russell Sage Foundation. Women and the trades. Pittsburgh, 1907-08. The Pittsburgh Survey findings in six volumes, edited by Paul Underwood Kellogg. 8vo. New York, 1909. (The Charities Publication Committee.)

Chailley (*Joseph*). Administrative problems of British India. Translated by Sir William Meyer, K.C.I.E. xv + 590 pp., 8vo. London, 1910. (Messrs. Macmillan and Co.)

Cruppi (*Jean*). Pour l'expansion économique de la France. Dix-neuf mois au Ministère du Commerce et de l'Industrie. 391 pp., sm. 8vo. Paris, 1910. (M. P.-V. Stock.)

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SUGGESTED LINES *of* ADVANCE *in* ENGLISH VITAL STATISTICS.

By T. H. C. STEVENSON, M.D.

[Read before the Royal Statistical Society, June 21, 1910, the President,
Sir J. A. BAINES, C.S.I., in the Chair.]

THE conditions under which the work of the Statistical Department of the General Register Office is carried on limit the opportunity for introduction of important changes in the methods employed to the commencement of a new decennium. Such changes as may seem to be called for have therefore to be planned towards the close of the preceding decennium, at a time when the plans for the approaching Census are also necessarily under consideration. It is to some of the more important changes contemplated under both headings—in the case of the Census to a considerable extent in accordance with the recommendations of this Society—that I desire to direct your attention this evening. My object, in which the Registrar-General concurs, is by ventilating these matters to test the way in which the proposed alterations are likely to be regarded by statisticians in general. In the hope therefore that this paper will initiate a useful discussion, the number of subjects dealt with has been limited to those of chief importance, and these are presented in outline only, in order that the opportunity afforded for criticism may be as ample as possible.

It should be added with regard to the views expressed, and the proposed methods described, that though I am personally responsible for their presentation, they represent rather the joint conclusions arrived at by the Registrar-General and certain members of his staff. These opinions are to a large extent still open to revision, and criticism will therefore be more useful at the present time than after the Census Report has been published.

CHANGES IN THE ANNUAL REPORT OF THE REGISTRAR-GENERAL.

The opportunity for making changes in the tables presented in this volume, other than the introduction of new matter, is limited to the commencement of new decennia by the requirements of the Decennial Supplement.

Substitution of administrative for registration areas in the Annual Report.

It is proposed in 1911 to initiate a reform which has been long demanded by vital statisticians, namely, the substitution of administrative for registration areas in this report. The advocates of this change have generally proposed that it should be effected by the assimilation of registration to administrative areas. While, however, it is very possible that future legislation may bring this about, and so lighten our task, there are grave administrative difficulties in the way of carrying it out while the law remains unaltered.

The intention therefore is to continue to collect the deaths by registration districts, but to tabulate them by administrative districts. This can be done by preparing a card for each death. These cards will bear the name of the registration district, with date and number of entry for purposes of identification, and will also bear the name of the administrative area where the deceased lived, which is already supplied by the local registrar, or in certain cases of that to which the death is, on other grounds, assignable.

Sorting and counting of punched cards by means of electro-magnetic machines.

It has been found that for the tabulation of these cards the system which appears most attractive is that whereby sorting is effected by a machine actuated by electro-magnets, which come into operation when holes punched in the cards permit electric contact to be made. By means of an appropriate code the position of the holes is made to represent the information to be tabulated. This is, of course, essentially the process associated with the name of Mr. Hollerith, and applied by him to the tabulation of the United States Censuses of 1890 and 1900, and of other national Censuses, but its proposed application here presents some points of interest. It is not intended to use the Hollerith machine, by which combinations of facts can be tabulated at a single operation, but a sorting machine which, dealing with one set of facts at a time, rapidly sorts the cards into ten groups in one passage through the machine, 100 groups in two passages, 1,000 in three, and so on. This machine has been for some years in successful operation, and has been used

as an adjunct to the tabulating machine already referred to. It has now, however, for the first time been fitted with a counting attachment which counts the groups of cards as sorted, and can be made also to print the results on strips of paper. The first of these combined machines has recently been constructed by the British Tabulating Machine Company, of Norfolk Street, Strand, and is at present being tried on census work in the General Register Office, with a view to its possible adoption for the purposes of the coming Census.

The adoption of a machine-sorted card system will be of enormous advantage in rendering possible the compilation of tables dealing with the recorded facts in any desired combination. Once the punched cards are prepared it will be a simple matter at any future time, even many years afterwards, to run them afresh through the machine in such a way as to tabulate fresh relationships of facts, not previously recorded.

When using this machine it will not be necessary, as a rule, to prepare more detailed tables for any locality than those required for publication. The report of the Society's Census Committee assumes that such detailed tables for small areas will still, as in the past, be a necessary stage in the compilation of the extended tables. Their existence under his present system of tabulation has enabled the Registrar-General, if desired, to furnish detailed information for any area dealt with; and it will be advisable with a card system either to continue the compilation of such tables, which would be wasteful, or, better, to preserve the cards, and so be in a position at any time to furnish for any locality any information tabulated, or capable of being tabulated, from them.

Necessity of cards in tabulating deaths by administrative areas.

The tabulation of causes of death by administrative districts offers a particularly favourable field for the use of this machine, because, as it happens, cards must be used in any case. It will be necessary to include with the deaths of each district those of a number of its residents dying elsewhere, and to exclude a number of deaths of persons not belonging to the district, as is done by Medical Officers of Health. The deaths allocated to a single administrative district may then come from any registration district in the country, and it becomes necessary to prepare a card for each death, and to rearrange the cards by administrative areas. Failing a machine process, cards would have to be written and sorted by hand, and so the chief cost of the machine process—the provision and preparation of the cards—would have to be incurred whether machines were used or not.

Method of preparing tables.

It is proposed first to sort the cards by causes of death and ages, so as to prepare the extended table of causes of death at different ages for the whole country. Then, by a simple device provided for in coding, each age and cause group could be divided quickly into four, corresponding to London, other great towns, smaller urban areas, and rural districts. Extended tables would thus be furnished for each of these populations, whereas, at present, this is done only for London. By a succession of similar processes the other tables in the Registrar-General's Annual Report will be prepared, substituting administrative for the present registration areas throughout. The last set of tables to be prepared will give the most important causes of death in every administrative area, but without distinction of age, and the cards will be left in suitable order for the subsequent preparation of the tables in the Decennial Supplement.

Proposed means of avoiding discrepancies with tables prepared by Medical Officers of Health.

This last table will inevitably be similar to that prepared by the Medical Officer of Health for the same area, and it is hoped as the result of consultation with the Local Government Board to have the headings relating to causes of death identical or practically so. It remains to secure identity of entries. With this object in view a scheme has been submitted to the Council of the Society of Medical Officers of Health by the Medical Officer of the Local Government Board and myself, and has now been approved by the Council for recommendation to the members of the Society. The main idea of the scheme has been borrowed from Dr. Cressy Wilbur, of the United States Census Office. It provides for the use of numbers to indicate the various causes of death. The compiler of the local table, working by the same rules as employed at Somerset House, would write the number of the cause to which he classed the death upon the list furnished him by the registrar. These lists would later be forwarded to Somerset House, and the numbers compared with those selected there. Errors of practice on either side can thus be brought to light, but the amount of work involved will necessitate a very gradual adoption of the scheme. It is proposed to commence with a few important areas, and as the system becomes established with these and acquires smoothness in running as experience is gained on both sides, to extend it gradually to an increasing number of other districts. It is thought that it will be better not to deal with the smaller areas direct, but to endeavour to induce the County Medical Officers of Health, now that every county will

have such an officer, to undertake the work of deciding to which numbered cause of death upon the list each death should be referred. By doing so he will, it is believed, much increase the interest and value of his own subsequent work in collating the statistics for the county, since all the district tables which form his raw material will represent the fruit of his previous voluntary labours, and will therefore be compiled with greater uniformity than the present system secures.

While the Medical Officer of Health is coding his deaths for classification it is hoped that he will institute inquiries in cases of incomplete or indefinite certification, and note the results on his lists of deaths. At present many Medical Officers of Health do this to a greater or less extent, and it is also done to a certain extent at the General Register Office, but it is only very exceptionally that either places the results of these inquiries at the disposal of the other. A system of co-operation would prevent overlapping and waste of effort, and would save practitioners from the annoyance of two independent inquiries about a single certificate.

Proposed adoption of the international list of causes of death.

The substitution of sanitary for registration areas in the Annual Report of the Registrar-General seems at first sight a simple matter, provided the facts can be arranged in that form, but on closer examination its consequences prove to be very far reaching. Some of the difficulties involved, and of the methods by which it is hoped they may be overcome, have been already described. Another important change which may follow, and largely result from the form of publication, is the adoption of the International or "Bertillon" scheme of classifying deaths. This is now established on a firm international basis. The United Kingdom is the only important section of the English-speaking world which has not already adopted it, and it is very widely used on the European Continent. Its revision is carried out every ten years by an international committee, that for the new decennium having been recently issued in Paris.

When the decision to publish by administrative areas rendered it necessary to consider parallelism with local practice, the first and most formidable difficulty was presented by the fact that the lists of causes of death in use at the General Register Office differ from those used by Medical Officers of Health. Most of these officers use the form (Table IV), circulated by the Local Government Board, but some of those having large populations to deal with use more elaborate lists, frequently one issued by the Society of Medical Officers of Health, which, in the words of its authors 'closely agrees

with the extended schedule of the Commission," and represents therefore a distinct advance towards international comparability. The lists adopted by the Registrar-General are seldom, if ever, employed.

It was necessary to consider the adoption of a list which would be used in common by both sets of workers, and it was felt that for this purpose one possessing the prestige of international sanction offers great advantages. For it alone could we at the General Register Office entertain the idea of accepting from an external source modifications, unless individually acceptable, of our present practice in this matter, and past experience had shown that the list at present in use by the Registrar-General was not likely, either in its extended or its condensed form, to be generally adopted.

The international list alone seemed likely to meet with general acceptance, besides offering the further advantage of providing neutral ground by the use of which neither the Registrar-General nor the Local Government Board would be asked to adopt the anomalies—and there appear to be such in all classifications—of the practice of the other.

The difficulty in the way of making this very important and serious change is the risk that it may endanger the valuable continuity of our records. This danger is the more serious in this country in proportion as the records concerned are more complete and relate to a longer series of years than those of most of the countries which have already adopted the international scheme.

For this reason it has been considered inadvisable to adopt the international scheme without modification. In a number of instances it will be necessary, in order that our records in future may compare with the past as well as with those of other countries, to differentiate causes of death, the intrinsic importance of which has not been considered to warrant such treatment in the international list. For instance, hypostatic pneumonia is classified by the Registrar-General with pneumonia, forming a not inconsiderable proportion of the total pneumonia deaths, while under the international system it is grouped with a number of related conditions under the heading "pulmonary congestion and apoplexy." To maintain continuity the deaths from hypostatic pneumonia must be separately stated either in the main or in a supplementary table. Their addition to the international pneumonia will then reconstitute our present group of pneumonia deaths. In other cases the headings of the international list must be sub-divided to distinguish causes of death shown separately in our present list, though not in the international. This, however, is merely a matter of sub-division

which does not seriously affect comparability, as the sum of the entries under our two headings will correspond with the entries under the undivided international heading.

Finally, it is possible that on one or two points we may find it necessary to retain differences from the international list more serious than sub-division of its headings, but it is hoped that such cases will not be numerous, nor of great importance.

Probably it will prove most convenient to make the main list agree as closely as possible with the international save for certain sub-divisions of headings, but to add a supplementary list showing the numbers of deaths at various ages from certain causes which are included under different headings in the international and in the present English lists. To facilitate comparison the numbers of the international list should be printed. This proposal practically amounts to the adoption of the international list *plus* a separate supplemental list of transfers, by means of which it will be possible to reconstruct the items of our present list.

A short list, which would be used for tabulation of all returns from administrative areas, has been arranged with the Medical Officer of the Local Government Board, and the extended list has been carefully considered in conference with the Scottish and Irish register offices.

Rules for distributing deaths of non-residents.

The same stage has also been reached so far as the Local Government Board is concerned with regard to the rules to be observed in allocating to their own districts the deaths of persons dying away from them. The rules of the Registrar-General have, in the past, differed from those of the Local Government Board, and have been only of a very partial applicability. Thus, for example, it has been possible to exclude from the London tables all deaths of non-Londoners, but not to include deaths of all Londoners dying outside the Metropolis, so that the application of this correction has somewhat understated the death rate of London as given in the Annual Summary. Medical Officers of Health have been met by the same difficulty, and have not always been able to counteract the understatement of death rates which results from this cause. Under the scheme now proposed, the General Register Office will become a clearing house for all deaths occurring in England and Wales, and it will no longer be possible for the Registrar-General to exclude a death from one locality without including it elsewhere. These exclusions and inclusions, moreover, will, for the first time, be made upon a system uniform with that recommended to Medical Officers of Health by the Local Government Board, so that, for the

first time, a truly national rule of practice in the compilation of death returns will be laid down. It is true that Medical Officers of Health may not be in a position to carry out the distribution of these deaths so completely as the Registrar-General, but many make great efforts now to secure completeness, and with identity of rule, and possibly improved means of distribution, the results attained in such cases should approximate very closely indeed to those published later in the Annual Report of the Registrar-General.

*Effect upon the publications of the Registrar-General of the changes
above described.*

One effect of the changes proposed will be to increase the importance of the Annual Report at the expense of that of the other periodical publications of the Registrar-General. In some respects, at present, the Annual Summary is the most useful of these publications, since it alone gives returns for administrative areas, and embodies corrections, though necessarily incomplete, for deaths of non-residents. But when these two features are incorporated in the Annual Report the Summary will lose its interest as a permanent record, and, as the Registrar-General points out in the introduction to this year's Summary, it will become advisable to limit the contents to matter of a nature which demands early publication, even though in a merely provisional form. In fact, the relation of the Summary to the Report will be that of the preliminary to the final Census Report.

PROPOSED NEW FEATURES IN THE CENSUS OF 1911.

As it is impossible to discuss all the changes proposed in connection with the approaching Census, many of them in conformity with the recommendations of the Census Committee of this Society, my remarks will be limited to a few of the principal new departures contemplated.

In the first place I must express my regret that the most important of your Committee's proposals, a reform quite as ardently desired by the census committee presided over by the Registrar-General, has proved impossible of realisation for the present, on account of the expense involved. I refer, of course, to the project of a permanent Census Act, providing for quinquennial censuses, of which those taken in 1916 and thence alternately might be much simpler in nature than the others. Till Parliament is prepared to provide the cost, nothing can be done in this matter beyond the education of public and official opinion by means such as this Society has already employed on various occasions. It may be mentioned that since 1901 a permanent Census Department has

existed in miniature for the purpose of dealing with changes in boundaries.

Census maps.

One of the most formidable difficulties in compiling the Census of England and Wales is presented by the complication of areas which have to be dealt with. The number of different kinds of area has been gradually increased for different purposes till now there are some eighteen in all, for which figures were published in the 1901 Census. Many of these are built up from the civil parish as a unit, and are therefore comparatively simple to deal with, but others are very largely independent of the civil parish, and, even where it is for the most part the unit, there are numerous exceptions where boundaries of larger areas cut across it. Then there are numerous "detached portions" of parishes to be dealt with, some with inhabitants and some without. There has never till now been a set of maps showing all these various areas, and in their absence the apportionment of population at previous censuses to areas of complicated or obscure boundary, such as ecclesiastical parishes, was a matter of great difficulty. Registrars were left to use the best information they could obtain locally, and naturally made many mistakes of allocation, which involved much correspondence and delay in the work of the Census Office.

In preparation for the Census of 1911 a set of maps has been prepared, and is now approaching completion, which shows all the necessary boundaries on the 6-inch or 25-inch Ordnance Survey sheets. Ecclesiastical parishes have never been completely mapped in this way before, and the labour of collecting the information from Ecclesiastical Commissioners, diocesan registrars, incumbents and others, and transferring it to the sheets, has been very considerable. Copies of so much of this map as relates to his sub-district are being sent out to each of the registrars who will now be able, for the first time, to see clearly in which of each class of areas every inhabited house is situated. Amongst the benefits anticipated from this undertaking are a better and more convenient arrangement of enumeration areas, a great diminution in the work and correspondence involved by detected errors on the part of enumerators and registrars, and a more accurate statement of the population of the various types of area, owing to diminution of undetected errors. These maps will be kept up to date in future, changes of boundary being marked upon them as reported from time to time.

In addition to the maps above described it is proposed to alter the published maps by substituting for the present county diagrams a number of statistical maps and diagrams. The information given in the county diagrams is much better presented in a set of

diagrams issued by the Ordnance Survey, and their inclusion last time considerably increased the price of the county parts.

Fertility of marriage.

The new feature of the approaching Census which interests me personally above all others is the proposal, made originally by the Census Committee of this Society, to include in the schedule an inquiry as to duration of marriage and number of children born. Information on these subjects may be obtained either from the Census or from the registers of births or of deaths, and it has in various places been obtained from all three sources. It will be recalled that Mathews Duncan's book upon fecundity is founded upon the facts collected in Scotland during the first year of compulsory registration of births in that country (1855). Unfortunately it was considered too troublesome to obtain the information in question, and the questions required for the purpose were dropped in Scotland. They have never been put in England. It is very much to be desired that when the revision of our registration laws is undertaken, due provision will be made for obtaining information of this type along with the registration of births, if not also of deaths.

As there are no registration facts available in this country, the only means at present by which the desired information may be obtained consists of a census inquiry. The power to make this is asked for in the Bill now before Parliament, and I had hoped to be in a position to refer to the matter as settled. I trust, however, that there can be little doubt that the questions will be allowed. I shall endeavour to demonstrate their importance by describing the methods whereby it is proposed by means of them to pursue certain inquiries of very great and at the present time of rapidly increasing interest.

The information will be tabulated only for husbands and wives enumerated on the same schedule. These in 1901 formed $92\frac{1}{2}$ per cent. of the whole, and by omitting the others many cases of voluntary or involuntary separation are avoided, the inclusion of which could but prejudice the figures. The questions will be simply as to number of years married and number of children born alive, and the number of these since dead.

From the replies received it is proposed to construct, in the first place, a table for the whole country, showing the average fertility of every class of couple where the wife's census age is under 45. That is, the table will state the average number of births annually since marriage per 100 couples married x years, the husband having been aged y , and the wife z years at marriage. It is necessary to assume

that fertility may vary with the age of both husband and wife, and with the duration of the marriage, and to present the results of the inquiry in such a manner as to bring out these variations. This can be done by dividing the table into sections, one for each year of duration of marriage. As the wife's census age would in no case exceed 45, thirty sections will be required, and these will be of such a size that the whole table will occupy fifteen pages of the Census Report.

From such a table as this it will be possible, for the first time, to get an accurate comparison of the fertility of women of differing ages in this country. Fertility rates stated per 1,000 married women of differing ages, did we possess them, would not give this, for on an average the older wives have older husbands also, and we know from Körösi's investigations that male fertility, like female, rapidly lessens with advancing age. Hence a statement of the recorded fertility of women of varying ages is a very imperfect measure of their actual capacity for child-bearing, unless the comparison is between wives of different ages married to husbands of a single given age. This will be possible with such a table as that sketched, which will have the additional advantage that the disturbing influence of varying durations of marriage can also be eliminated.

Dealing with forty ages of husbands, thirty ages of wives, and thirty durations of marriage, such a table can be supposed to contain 36,000 possible entries. A large proportion of these, however, need not be provided for, when dealing with the longer durations of marriage. If a couple have been twenty-five years married, and the wife's census age is under 45, she cannot have been over 20 at marriage, so only a small number of wives' ages at marriage need be provided for in the sections of the table dealing with the longer marriage durations. But even if we assume the vast bulk of the entries concentrated upon, say 10,000 of the commoner combinations, the scattering would still be such that stable rates could only be afforded by very large populations. In England and Wales, however, there are somewhere in the neighbourhood of 4,000,000 couples fulfilling the condition as to wife's age, so these 10,000 important combinations should average 300-400 entries each, or quite enough to furnish fairly stable rates. It is to be feared that considerations of space will probably forbid any extensive publication of the actual numbers of couples and of children upon which the various fertility rates are founded. It may be possible to do this to some extent, and numbers below a certain fixed standard might, in the other parts of the table, be distinguished by a different fount of type.

It is greatly to be regretted that we have not a table of the kind referring to a period anterior to the commencement of the recent fall in the birth-rate. Such tables compiled in connection with the 1871 and 1881 censuses might have been accepted as fairly indicative of the reproductive powers of the people, whereas now we can only record the actual fertility under artificial conditions. It was impossible thirty years ago, however, to foresee that an opportunity was being let slip which might never recur, and the only wise course now seems to consist in improving the opportunity of recording the present state of affairs. It must be borne in mind, however, that such a table will refer largely to the past as well as to the present. It is only for the very shortest durations of marriage that it can be said to reflect the conditions of the present day. In this particular material collected with birth registration would have the advantage, for it would show the present fertility rate of women however long married, whereas the census table can only yield a rate for the marriages of longer duration which combines the results of the woman's fertility as a young woman at a time when the birth-rate was much higher than at present with those of her fertility as an older woman at the present time. For this reason the sections of the table will probably be found of decreasing value as the duration of marriage increases, and it is very desirable that birth registration should be so improved as to obtain the information necessary to state for men and women of each age their actual fertility at that age under the conditions of the present day. It is a question indeed whether the longer durations of marriage should not be grouped for the purpose of the table.

Fertility in relation to social position.

In addition to the table described for the whole population, it is proposed, at the same time, to construct similar tables for three or four sections of the population, arranged so as to represent social strata. The determination of the stratum to which each couple is to be referred is a matter of considerable difficulty, but it is felt that the task should be undertaken for the purpose of definitely determining the very important question of the relative degrees of fertility of the various grades of society. The use of occupation for the purpose has been considered, but it was found that this would be a very imperfect test. We shall, therefore, probably use Mr. Booth's criteria—numbers of rooms, or of domestic servants, in relation to number of persons in family. There are various fallacies in the use of these tests also, but we can devise no better.

The fertile couple will, in many cases, require more rooms

or more servants on account of its fertility. This, however, if fertility decreases as we ascend the social scale, will lead only to an understatement of the true differences between the classes. Other difficulties are that many servants sleep out, that five rooms in a flat may mean quite a different thing from five rooms in a cottage, &c. Any suggestions towards the improvement of this very interesting but somewhat elusive comparison would be very welcome, but failing improvement we shall be content to work upon a scheme which can claim the high authority of Mr. Booth.

The tables will be on similar lines to the general table already described. Doubtless we shall suffer in many instances, in the case of the higher grade table, from lack of sufficient material to produce stable results. It may be necessary for this class to rest content with the rates for the most frequent combinations of age at marriage, but these would give all the essential information.

Condensed tables for separate occupations or localities.

In addition to these extended tables it is proposed to publish condensed tables for separate occupations or small groups of occupations, and possibly for separate localities. These will be compressed to one-fifth the size in each of three dimensions—age of husband, age of wife, and duration of marriage—and will therefore occupy only $\frac{1}{125}$ the space of the extended tables. They will, in fact, be so small that a considerable number can be published. Ages at marriage of husband would probably be stated in eight quinquennia and of wives in six, each section of the table referring to a quinquennium of marriage duration. The practical difficulties of rearranging the facts in this form by the aid of cards—the use of cards will be essential at all stages of this fertility inquiry—are not very great, and we think that these small tables will be of much interest. Differences in fertility will very likely be found between persons of the same social class who are connected with different occupations, as in the case cited by Mr. and Mrs. Whetham, of army officers with an estimated average family of 2.1 living children, and clergymen with an average of 4.2 living children. It will be interesting, also, to ascertain whether occupations for which children early become an asset tend to larger families than others. It may be, moreover, that the study of occupational fertilities will reveal some other line of cleavage between the fertile and the infertile than that commonly suggested of position in the social scale. In fact, so little is definitely known at present upon all these points, and so much interest attaches to surmises concerning them, that the precise information now to be obtained should yield results of exceptional value. The influence of the husband's occupation upon

infantile and child mortality may, of course, be brought out at the same time for the shorter durations of marriage by tabulating the numbers of children dead.

Occupation of married women.

It is not only, however, the husband's occupation which is of interest in this connection, but also that of the wife, and we believe that the Census can be made to supplement the results of the recent Home Office inquiry into the industrial employment of married women in its relation to infantile mortality. For this purpose it is proposed to record on the card used the wife's occupation as well as the husband's. The occupations of wives would be roughly grouped under a small number of comprehensive headings, which will suffice for the purpose, as after all the main point is to know whether the wife is or is not engaged in gainful occupation. It will also be important to differentiate gainful employments pursued at home. The infantile mortality experience of these classes of mothers can be measured fairly well by the proportion of children lost during the first two years of married life. The relation of this figure to the corresponding figure for all mothers will be a fairly good test of the infantile mortality, and it will be of much interest also to ascertain the bearing of the wife's occupation upon fertility, which will be directly shown.

Fallacy of ante-nuptial conceptions and births.

It is unfortunate that the early marriage durations, which are much the most interesting in many respects, are those for which the results will be most adversely affected by ante-nuptial conceptions. All such children will doubtless be returned without distinction if born in wedlock, and very likely some children whose birth was followed by marriage will also be included. This will cause overstatement of fertility chiefly of early married life, but it does not seem possible in a census inquiry to avoid this fallacy. Any attempt to secure differentiation of ante-nuptial conceptions would be bound to fail, and would probably prejudice the whole inquiry.

Infantile mortality in relation to age of parents and duration of marriage.

Another proposed use of the returns is to throw light upon the influence on infantile and child mortality of duration of marriage and age at marriage of father and mother. It will be of interest to know whether young or old, and whether newly or long-married mothers lose most children, and at what age, from this point of view, women under different circumstances should marry.

Size of completed families.

Finally, it is proposed to link up the fertility of the present with that of the past by means of a set of tables relating to wives aged over 45 at census. If it be assumed that the average woman's fertility ceases at about 45, women above this age must be excluded from the fertility tables, as the fertility coefficient in their case would be compounded from a period of fertility and a period of infertility. It is of interest, however, to know how many children women, married at any given age, and whose fertile period is completed, have had. Returns of this character will be obtained regarding women married long before the fall in the birth-rate commenced. It is proposed to embody these returns in tables which will ignore the husband's age, but will state separately for the marriages of each decade—say, of the latter half of the nineteenth century—the number of wives of each year of age at marriage who have had families of 0, 1, 2, 3, &c., children, with the average family in each case. Comparison of the different tables should give an accurate measure of the decrease in size of the modern family. The effect upon this of any change in the average age of husband selected by women of a given age should be very slight, and may, it is believed, be ignored.

Houses and Dwellings.

Alterations of first-class importance are proposed also in connection with the two very important subjects of houses and tenements, and of occupation and industries, but these can be described only in the briefest outline.

The recommendation of the Society's Committee to tabulate the number of inhabitants of each tenement—dwelling will probably be the term employed, as in the United States Census—has been adopted, and a form of table has been devised for the separate statement of numbers of children under ten. The statement for each size of dwelling of all the possible combinations of numbers of persons under and over ten is however very cumbrous, though by no means impossible; and it can be argued that the distinction is undesirable from a hygienic point of view, as implying that, *e.g.*, a two-roomed dwelling with four adults and two children is less overcrowded than a similar dwelling with six adults. It is to be presumed that some authorities desire information of this type, as the London County Council paid a considerable sum to obtain it after the 1901 Census. A statement of the arguments in favour of making the distinction would be very welcome. The tables, whether referring separately to children or not, will of course apply to dwellings of all sizes.

So strongly is it felt that the dwelling, and not the house, is the decisive factor in connection with housing that it is under consideration to substitute numbers of dwellings (divided into private dwellings and dwellings of all other types) for numbers of houses in all those tables which have hitherto given merely acreage, houses and population for the different types of area. Houses would in that case be separately dealt with in separate tables, at all events for the large towns, distinguishing private houses, blocks of flats, institutions, &c.

We should thus avoid the anomaly of reckoning as separate houses a number of dwellings if built side by side, while twenty or more may count as a single house if built one on top of another, with a common entrance from the street. In the rural and small urban areas, for which the tables relating to houses could not well be given, it may be assumed that for the most part house and dwelling still mean the same thing. On the other hand, it would be very interesting to be in a position to measure the changes occurring in the nature of the house accommodation provided in large cities by means of tables which would state, *inter alia*, the numbers of blocks of flats enumerated, and of separate dwellings and of population contained in these blocks.

Occupations and industries.

Perhaps I need scarcely apologise for a brief reference to the tabulation of occupations in a paper dealing with vital statistics. If it be thought that the bearing of occupation upon vitality, as illustrated by occupational mortality, the diseases of occupations, the relation of infantile mortality to parents' occupations, and occupational fertility or birth-rates, is insufficient to justify this course, I would plead the desirability of utilising the present opportunity to obtain expressions of opinion upon an important question which has to be decided in this connection.

Hitherto, the Census Reports in this country have dealt almost exclusively with the occupation of the individual *quâ* individual, and have made little attempt to indicate the industry in association with which the occupation is pursued. It has recently, however, been strongly urged upon the Registrar-General that he should supplement the occupational by industrial figures. No proposition to this effect figured in the recommendations of your Census Committee, but returns of this nature form a prominent feature of the employment statistics of most foreign countries. Some, like the United States, classify both by personal occupations and by industries, though it should be noted that the information as to industries is not obtained by means of the ordinary

householder's, but of an employer's schedule. Other countries, as for instance, France and Germany, tabulate only on the industrial basis, as we only on the occupational. Thus, it can be ascertained from the French census what is the total number of persons employed in the cotton industry, but not how many of these are clerks, while our census gives the total number of commercial clerks, but not the number of these employed in the cotton industry.

So far as the Registrar-General has been able to ascertain, the present classification is generally regarded as satisfactory from an occupational point of view, and he has been strongly urged to alter it as little as possible. The problem for present consideration, therefore, is whether, without interfering with the collection of the returns required for producing the old occupational tables, provision can at the same time be made upon the householder's schedule for obtaining the information required for an industrial classification. It appears very much open to question whether a classification dealing only with the industrial side of the problem does not sacrifice more information of practical importance than the purely occupational classification. It is the latter almost alone which is required for the purposes of vital statistics, while it shares with the industrial classification the merit of utility in economic investigations. In dealing with the problem of unemployment and other economic questions affecting the individual the occupational classification is of primary importance, while the industrial, of course, is needed for the discussion of industrial problems. I can at present, therefore, see no good reason for describing one classification as more "scientific" than the other. Both are required, each for its own purposes; and the proper solution of the difficulty of choice seems to lie in adopting both. There are, moreover, important uses to which a table combining the two classifications and showing the relation of the one to the other can be put, but which can be served by neither classification alone, and such a table can, of course, be constructed only if information is collected under both headings.

It is most important to ensure that in trying to obtain the new information we do not interfere with the collection of the old. This risk has been constantly kept in view by the Registrar-General in framing the proposed forms of question, and he is inclined to think that it can be reduced to such small dimensions that it may properly be incurred.

Assuming the new question put, there remains the question of tabulation. The best method of tabulating the old and new information, so as, while avoiding prohibitive bulk and expense, to afford the most useful information to the various descriptions of

workers in this field, is a question upon which the opinions of this Society or of individual Fellows would be particularly useful. The present occupational tables must be altered as little as possible. Their form in 1901 was settled after prolonged discussion with various Government offices and other important users of the tables, and has been found satisfactory by these. An independent industrial tabulation will probably be given, at all events for the country as a whole. Whether this is of sufficient importance to justify its publication for separate localities has not yet been decided, and probably cannot be finally decided till it is seen how the new question is answered on the schedules. It will probably be advisable when attempting an industrial tabulation for the first time, and that too without making use of the methods generally employed for the purpose, to restrict the headings to a moderate number, not over 100, which would allow for separate listing of the great industries, but not of their sub-divisions.

Having given a simple industrial classification of this type for the whole country, and probably for some of the more important localities, we might very well go on to show for England and Wales the relation between the two tables, that is, the occupations connected with each industry, with the numbers engaged, or *vice versâ*, the industries in association with which persons of each occupation are employed. This would be a simple matter with cards, though quite out of the question without them. The lengthy table which would result from a statement even of the more important combinations might to some extent possibly take the place of the publication of the numbers described under each term found in the Registrar-General's Dictionary of Occupations, as recommended by the Society's Census Committee. The proposal as it stands amounts to a request for tabulation of occupations under some 13,000 headings—a task beyond the capacity of the Census Office under any scheme of compilation at present under consideration. There would be no difficulty, however, in publishing the dictionary of occupations without the numbers, and this may be done.

DISCUSSION *on* DR. STEVENSON'S PAPER.

MR. NOEL HUMPHREYS said that all interested in vital statistics, and fortunately their number was constantly increasing, would, he felt sure, wish to associate themselves with a hearty vote of thanks to the author of the Paper, which bristled with interesting points of statistical practice and administration, and well deserved full and careful consideration. He was pleased to congratulate the author on so successfully following the example of his two eminent predecessors in office, Dr. Farr and Dr. Ogle; and the Society might be congratulated on the fact that for the first time since the institution of the civil registration of births, deaths and marriages, the Registrar-General and his Superintendent of Statistics were both Fellows of the Society with a keen interest in vital statistics. Among the many and promising changes in the Registrar-General's Statistical Reports suggested for adoption in the new decennium by far the most important were, first, the substitution of administrative areas for the old registration districts which were, for the most part, co-extensive with Poor Law Unions; and, secondly, the adoption of a machine-sorted card system with electrical tabulation by means of an improved Hollerith machine. Those who recognised the increasing influence of mortality statistics on health progress would find it difficult to overestimate the value of adopting the administrative area as the unit for vital statistics; and the adoption of the card system would, with other obvious advantages, facilitate the important distribution of deaths occurring outside the area to which they properly belonged. The importance of debiting all deaths in institutions to the areas from which the deceased inmates were admitted was beyond question, and such distribution would materially add to the accuracy and value of local statistics. He had, however, very grave doubt as to the expediency at present of attempting to exclude from administrative areas any deaths occurring therein, unless they were recorded in institutions receiving inmates from outside such areas. The author had told them that the Medical Officers of Health adopted the practice of excluding other deaths than those in institutions; but such a practice was fraught with difficulty and seemed to be open to abuse. The previous residence of all persons dying in institutions should always be recorded in the Death Register; but entries recording the deaths of other persons who died away from home contained no such information, and there would be obvious difficulty in such cases in deciding whether the deceased person was a resident or a visitor in the administrative area within which the death occurred. It was easy to understand that Medical Officers of Health, especially of health resorts, should be anxious to exclude the deaths of invalid visitors; but it appeared desirable that both the Registrar-General and Medical Officers of Health, in the proposed distribution of deaths, should alone be guided by the facts recorded in the Death Register. The substitution of administration areas for registration districts would neces-

sarily afford means for comparing the Registrar-General's statistics with those issued by local Medical Officers of Health. That fact appeared to have been a subject of conference between the Local Government Board, the General Register Office, and the Society of Medical Officers of Health; and the Paper suggested most elaborate arrangements with a view to securing uniformity in the distribution of deaths and in the classification of diseases. That under the proposed system there should be minor discrepancies between the Registrar-General's and local figures was probably unavoidable; but such discrepancies would surely lead to increasing future accuracy. He felt bound to demur to the proposal that local figures should be submitted to Somerset House for revision and for comparison with official figures before publication, because he thought such a course would lead to endless correspondence, to very probable friction, and would cause delay in the publication of both official and local returns. The proposed scheme for avoiding discrepancies between these returns appeared to him, moreover, too ambitious and too complicated. The advantages to be expected from the proposed extension of the census inquiry were unfortunately far more than counterbalanced by the once more successful opposition of the Treasury to the authorisation of an intermediate simple enumeration of the numbers, sex and age of the population, which was really of primary importance in all branches of State administration. Without fairly accurate knowledge of population, no trustworthy vital statistics could at any rate be constructed; and the result of imperfect information on this point, at the present time, might be judged from the following example. The Medical Officer of Health for Birmingham, in a recent Report, expressed his opinion that the present population of that city was, by the Registrar-General's method, over-estimated by fully 40,000 persons. The effect of this over-estimate was, of course, very considerably to understate both the birth-rate and the death-rate in that city, and thus seriously to depreciate the value of its vital statistics. At the present time the statistics for a considerable number of the large towns in England and Scotland were, without doubt, similarly invalidated. As a member of the recent Census Committee of the Society he was unable to support the proposal to require occupiers to state in their census schedule, under penalty, the duration of marriage and the number of their children born, deceased, and surviving. His objection was based on the ground that in the interests of accuracy it was inexpedient to overburden the census schedule, and it was especially so to ask questions which the occupier might be unwilling or might find it difficult to answer. The main ground on which this additional information was desired was to facilitate the construction of statistics of so-called fertility. It was well known that the recent well-marked decline of the birth-rate was not simply a question of fertility; and the marriage and birth registers afforded facilities for further useful investigation of that important subject. At any rate, he ventured to hope that without waiting a few years for the results of the census, the General Register Office would find it possible to publish statistics dealing

with the relative birth-rates in different social grades in order to throw light on one of the most disturbing assertions of the students of eugenics. He had much pleasure in proposing a hearty vote of thanks to the reader of the Paper.

Dr. DUDFIELD said he had much pleasure in seconding the vote of thanks, not only on account of the value of the observations the author had given in the Paper, but because there was foreshadowed in it the materialisation of many of the suggestions which he (Dr. Dudfield) made in a Paper which he read before the Society in January, 1905. The fact that he was so heartily in agreement with the new arrangements made him hesitate to criticise the Paper at any great length. There were, however, one or two points on which he would like to say a few words. The first related to the change from registration to administrative or sanitary areas for the purposes of tabulation. As they all knew, the principal Act relating to the registration of births and deaths (6 and 7 Wm. IV, c. 86) was about seventy-five years old. That was a pretty fair term of usefulness, and he thought the time was come when they might look for some new enactment. He regretted that the Registrar-General had, so to speak, made two bites at the cherry, in proposing to alter the methods of presenting the statistics, but not to adopt the larger scheme of altering the method of collecting them. If there were no chance of getting the law relating to the registration of births and deaths altered there was an alternative which might be brought forward, but it was, he feared, almost too logical to find ready acceptance at the hands of legislators. At the present moment they had notification of births, of sickness, and of accidents; and he thought the scheme might be extended to the notification of the *cause* of death. He felt convinced that such notification by medical men would lead to a much better standard of certification of the causes of death. In that case, the system of inquiries for clearing up doubtful points which, it had been suggested, should be largely extended, would be rendered unnecessary. Registration of the *fact* of death might be left as at present. Dr. Stevenson referred to the rules for the allocation of deaths, and on that point he (Dr. Dudfield) could not agree with Mr. Humphreys, because he (Dr. Dudfield) had had such a system in use for the past fifteen years. He had a fairly large number of deaths of extra-metropolitan non-residents in his district which he regularly forwarded to the Medical Officers of districts outside the metropolis. He also received every year information of a number of deaths in extra-metropolitan districts apart from those included in the returns sent weekly from Somerset House. In his opinion the principal difficulties in any allocation were to be anticipated in connection with the inmates of lunatic asylums and visitors to health resorts. The deaths in lunatic asylums gave him most difficulty, the home addresses of inmates being entered in the Asylum Registers in a very loose manner, and close inquiry usually resulted in no better information being obtainable. He had to accept deaths from asylums in different parts of the country which he felt sure did

not belong to him. He had had some experience with regard to visitors when he was the Medical Officer of Health of Eastbourne, where a fair number of visitors died during the year. By taking some trouble he thought such deaths could be satisfactorily allocated. It had occurred to him that the settlement of the deceased, in the Poor Law sense of the word, might furnish a useful basis for the allocation of deaths. He did not know whether it would be more difficult than the present system, but he would like to hear the suggestion discussed. Passing to the method of preparing the tables, he regretted to note what appeared to be an omission—he did not know whether it was intentional, or whether it was not thought necessary to refer to the matter. The author made no reference to the tabulation of births and sickness which he (Dr. Dudfield) thought should also be tabulated for sanitary areas. With regard to sickness, the notification returns from the more important sanitary areas were collected week by week by the Local Government Board and the returns could easily be extended to cover the whole country. He thought that the Registrar-General might, beginning with 1911, include in his Annual Report tables of sickness in sanitary areas as well as of deaths. In tabulating the death he hoped the Registrar-General would do something more than was suggested on p. 688. The proposition there was that there should be extended sex-age tables for the whole and for four large subdivisions of the country. Dr. Stevenson went on to say “the last set of tables to be prepared will give the most important causes of death in every administrative area, but without distinction of age or sex.” He hoped the Registrar-General would be able to accept the suggestion that at all events for sanitary districts having populations of 50,000 and upwards, the tables of causes of death should be by sex and age. In his Paper in 1905 he gave (in Appendix D) a skeleton table which he would like to see adopted. One advantage in the use of such a table would be that it would furnish material for the tables required for the Decennial Supplement. He was very glad to notice that the Bertillon scheme of tabulation was to be adopted with, he hoped, the smallest possible number of changes. He wished at this stage to express the hope that, at an early date, this country would be represented on the International Commission. Dr. Stevenson suggested that Dr. Cressy Wilbur, of the United States, was the first to introduce the numbers to the causes of death; but the Society of Medical Officers attached numbers to all the causes of death included in the schedules of causes of death issued by them in 1901. He, personally, had used numbers for purposes of tabulation since 1891.

Dr. STEVENSON said Dr. Wilbur's idea was a comparison of the numbers allocated locally with those allocated at the Central Office.

Dr. DUDFIELD said he had always endeavoured to make his tabulation of causes of death agree with that of the Central Office. With the introduction of the use of numbers the same cause of death would have the same number, locally and at the Central

Office. On p. 694 the author referred to the fact that the English Register of Births had never included any of the data demanded during the first year of the registration in Scotland, and seemed to suggest that an absolute change in the English law was necessary to secure such data. He desired to know whether section 44 of 37 and 38 Vic., c. 88, had been examined, because it seemed to him that that section gave the Registrar-General very wide powers to alter the form of schedule in the register, and to settle the information to be asked for. It seemed to him that the Registrar-General, under that section, could require information relating to number of children, &c., to be given when births were registered. He hoped that the age of 45 years would not be taken as the limit of fecundity in women. Some three or four years ago he collected a considerable amount of information bearing on that point. Communications were addressed to all the Maternity Hospitals which could be traced, and definite evidence was obtained that the age of 45 was too early. Having regard to the proposals for dealing with the size of families, when the fecundity period was absolutely finished, the age limit, he thought, ought to be raised to 55 years. A further point was raised with regard to fertility in relation to social position, but on this point the author appeared to contradict himself. At the foot of p. 696 he appeared to reject a suggestion to use occupational figures, yet, in the middle paragraph of the next page—headed “Condensed tables for separate occupations or localities”—he appeared to contemplate the use of occupational fertilities. As to the basis of such a tabulation, he ventured to suggest that a classification of five groups would be suitable, namely, “unoccupied” (wealthy), “professional,” “commercial,” “industrial,” and “agricultural.” It would, he thought, be feasible to subdivide the long schedule of occupations at present used by the Registrar-General into the five groups named, which appeared to be sufficiently defined to give a large amount of valuable information. As a Medical Officer of Health, he was especially interested in the paragraph on pp. 699 and 700 with regard to houses and dwellings. The author, however, considered that the statement, for each size of dwelling, of all possible combinations of numbers and persons under and over ten years of age was very cumbrous, though by no means impossible. He (Dr. Dudfield) had used such a table for some years past. “It can be argued,” Dr. Stevenson continued, “that the distinction is undesirable from a hygienic point of view, as implying that, *e.g.*, a two-roomed dwelling with four adults and two children is less overcrowded than a similar dwelling with six adults.” Under the law relating to overcrowding, the *maximum* cubic space which could be enforced for four adults and two children would be 2,000 cubic feet, and for six adults 2,400. There was a distinct difference in the term “overcrowding” when used by the Registrar-General and when used for administrative purposes. He much regretted that the Registrar-General had adopted the term when referring to “crowding.” Serious confusion was created owing to the use of the word “overcrowding” for statistical purposes to represent something which was not “overcrowding” from an administrative point

of view. The difference between statistical "overcrowding" and legal "overcrowding" amounted to from one third to nearly one half in favour of the latter. He wished, therefore, that some other word could be adopted. The proportions of children under ten occupying "overcrowded" rooms ought to be considered.

Dr. NEWSHOLME said the Society was to be congratulated first on receiving the Paper by Dr. Stevenson, who had succeeded in setting forth with conciseness and lucidity the main points of a very multifarious subject; and, secondly, on the fact that the Registrar-General's department had taken the Society into its confidence before making important changes. That was an example which they would think worthy of imitation in other quarters. There could be no doubt that if an adequate discussion of the Paper took place it might have a distinct influence in determining the statistical policy of the next ten years in the Registrar-General's office. Still more the Society should be congratulated on the fact that in future administrative instead of the registration areas were to be used as the basis of these vital statistics. That, as Mr. Noel Humphreys had said, was a reform of the greatest magnitude and represented an immense stride forward in value of the national statistics. He gathered from the Paper that the possibility of this reform was associated with the use of the card system. That being so, there was an additional reason for gratitude to the card system for having rendered such a reform possible. The checking of the tabulation of returns of causes of death obtained by the local Medical Officers of Health was very important. Mr. Noel Humphreys, with the conservatism which attacked all Government officials, saw immense difficulties in this reform, but he had not attached, he thought, sufficient importance to the fact that only a certain limited action was suggested which would gradually be increased as the Treasury supplied the funds, and in the light of experience, he saw nothing but great promise of important results from this attempt at collaboration between the Medical Officers of Health and the Registrar-General's office, and he hoped it would be pushed more quickly to full success even than Dr. Stevenson thought possible. He was glad that stress had been laid on the importance of continuity in the returns, which was most important. No doubt care would be taken that in adopting in the main the Bertillon classification of causes of death nothing would be lost in respect of continuity. There were great advantages in adopting the Bertillon classification, which was not very different, after all, from the system which ten or fifteen years ago was used in the Registrar-General's office itself. Stress had been laid on the importance of further correction of the deaths of non-residents in any given place; and it was a lamentable fact that up to the present time the statistics for local registration districts and sub-districts given in the Annual Report of the Registrar-General were entirely uncorrected; and consequently a large part of that large volume was at the present time relatively useless. It was therefore highly important that reform should take place. The only question was,

to what extent should the proposed correction be carried. Should it be carried to the extent that the deaths in public institutions should be transferred to the districts from which the persons came ; or, should it be carried further ? In the preliminary statistics for certain towns published in the Registrar-General's Annual Summary the correction had not hitherto been made even to this extent for all public institutions ; and therefore they would welcome the fact that in future, all institutional deaths would be transferred to the districts to which the persons dying properly belonged. This had been a subject of detailed negotiation between the Local Government Board and the Registrar-General's office. Personally, he agreed with Dr. Stevenson in thinking there would be no substantial difficulty in carrying the correction to the extent that all deaths should be distributed which occurred elsewhere than in domestic dwellings. Dr. Dudfield had raised the question of health resorts. In health resorts and commonly also in metropolitan boroughs and elsewhere the Medical Officer of Health was anxious to transfer the records of deaths of outsiders elsewhere. The process of exclusion was nearly always complete ; the process of inclusion seldom if ever was. But that ought not to be allowed to continue, and it would be difficult to continue it under the system proposed by the Registrar-General's office, as the statistics compiled locally on this "give" and "not take" system would in future fail to agree with the official statistics of the General Register Office.

Mr. R. H. HOOKER observed that it was proposed to obtain particulars of children only from husbands and wives enumerated in the same schedule. This would militate very seriously against a comparison, suggested later on, with the much earlier periods before the fall in the birth-rate commenced, and he would urge that widows and widowers should also be asked to state the number of their children. Otherwise, only an exceedingly small sample would be obtained regarding "women married long before the fall in the birth-rate commenced" ; in fact, details for "women whose fertile period was completed" before that time would only be forthcoming from those parents who had practically celebrated their golden wedding. If all persons who had been married were required to answer these questions, the particulars of fertility according to age of both husband and wife could easily be ascertained by tabulating separately the replies from those enumerated on the same schedule ; while the inclusion of all would give an enormously larger sample for obtaining particulars according to age of a single parent only.

Miss B. L. HUTCHINS asked whether married women occupied, and widows occupied, would be distinguished in the forthcoming census. She understood the Committee were going to recommend this change.

Mr. YULE said he would like to ask, as arising out of the question of correcting death-rates by the transfer of deaths from one district to another, what "population" meant. He believed

that the census population of a district was the actual population, and it appeared to him accordingly that they were correcting the deaths, but not correcting the population—correcting the numerator, and not correcting the denominator of the death-rate. Were not all temporary residents, visitors or hospital patients, included in the census in the district in which they happened to be living at the time? And yet, he gathered, their deaths were transferred. If the deaths were to be transferred, should not the census record a population *de droit* for the purpose of calculating death-rates, as well as a population *de fait*? The point, of course, became the more important as statistics of deaths got more and more correct. He supported Mr. Hooker concerning the tabulation of the fertility of widows. He noticed in reading the Paper that Dr. Stevenson altered the phrase in the proof, and said that information would be “tabulated” only for husbands and wives enumerated in the same schedule. If it would be collected for others, perhaps the point could be considered. Most of those who were married women before the fall in the birth-rate commenced, as it was put on p. 699, would by this time be widows, or, at least, a large proportion would. Dr. Stevenson referred to a very interesting question in the last part of the Paper—the question of the tabulation of occupations. He was very doubtful whether a satisfactory classification of occupations from the industrial standpoint was likely to be made on the basis of answers in the occupiers’ schedule, but, at the same time, he thought the industrial classification was of great importance. He would say it was of greater importance than the occupational in dealing with the problem of unemployment. When there was considerable unemployment in an industry, it would be liable to affect all classes in that industry—not only the hands, but also, to a certain extent, the clerks, and so on. In most other countries such industrial censuses were dealt with in a fashion entirely distinct from the ordinary population census, and that made the organisation much simpler. On the basis of the questions in the occupiers’ schedule, the population, when classified industrially, could not be also classified geographically as regards the locality in which the industry was conducted. One really wanted a day industrial census for that, stating in what district the person was employed, so that the number of employed under each industry could be given in the district in which the industry was actually at work—not in that in which the hands and employees were living. He was extremely interested in the whole Paper, and he might point out what an important precedent the reading of this Paper formed. It amounted to submitting the various proposed alterations in a most important part of the work of one of the chief government offices to criticism before their final adoption. This was a novel step of the highest scientific interest. Their thanks were due to Dr. Stevenson, and also to the Registrar-General, for the permission he had given Dr. Stevenson to submit these proposals to the Society.

Sir SHIRLEY MURPHY said that it appeared to him that the adoption of the very important proposal that the administrative and

not the registration area should be the unit of record would be a very great advance on the existing system. Dr. Newsholme had very properly noted how much importance attached to the need of preserving the continuity of our records, but in dealing with administrative areas it was necessary to remember that changes of boundary were constantly taking place, and it was not quite clear to him how it would be possible to allow for those changes from time to time. With regard to the work to be done by Medical Officers of Health, Dr. Newsholme had emphasised the point that the proposed system was to be introduced very gradually, and that was clearly inevitable. The Medical Officer of a large town, with a well organised office, was able to delegate the clerical work involved to others. But in small districts where the Medical Officer had no organised staff that would be more difficult, and especially so in cases where the Medical Officer was also a private practitioner; and probably in these districts, for some time to come, progress towards the actual identity of the local records with those of the Registrar-General would be slow. With regard to the criterion of social condition of populations, in the complete absence during the intercensal period of any information as to the occupancy of tenement rooms or the number of domestic servants, he found that the proportion of children scheduled for the purposes of elementary education provided an instructive test of the predominant social condition of different districts, and its application to such vital statistics as are known to be largely influenced by social conditions had afforded consistent results. Mr. Yule had referred to the correction of the enumerator and the neglect of the denominator. That was inevitable, he imagined, to a great degree, but even a large institution would have relatively little influence on the total population of a district.

Mr. YULE said he was thinking of the cases of watering-places and health resorts.

Sir SHIRLEY MURPHY said no doubt if they went outside institutions a great deal of difficulty arose. It was not, however, proposed to extend the correction to ordinary dwelling houses, but practically to restrict it to public institutions. He felt that Dr. Stevenson had done great service by bringing forward his Paper.

Dr. GREENWOOD said, with regard to the question of overcrowding, that a number of experiments had been made on that point by Rübner and other physiologists: Dr. Leonard Hill and himself had worked upon it for some years in connection with caisson disease. It was quite clear that supposing one had six adults in a given space the overcrowding was physiologically worse than with two adults and four children. Other things being equal, the main factor was the water vapour; and although the surface exposure was relatively smaller it was absolutely larger in the case of adults. The carbonic acid fallacy still reigned in the minds of some Officers of Health although rejected by physiologists. Dr.

Hill and himself had experimented with caissons, with regard to which the London County Council went to great expense to keep the percentage of carbonic acid gas below a certain amount. They found that a fairly high percentage of carbonic acid on the whole was definitely favourable. He had himself been exposed to very high pressures of air, and he found that a pressure of nearly 2 per cent. of carbonic oxide gas had no ill effects, while he had frequently exposed animals under similar conditions to from 3 or 4 up to once nearly 10 per cent. of CO₂ without unfavourable symptoms.¹ The whole problem of overcrowding, apart from the element of bacterial contamination, seemed mainly one of humidity.

Dr. STEVENSON, in reply, said he very cordially welcomed the criticisms which had been made, but there was not time for any lengthened reply. Mr. Noel Humphreys had referred to the limitation of the distribution of deaths of non-residents to institutional deaths. The proposal which was being considered did not go far beyond that ; it included with institutions, all cases of sudden death in the street or elsewhere than in dwellings which occurred before the person had time to reach the institution. It seemed rather strange that if a man was knocked down by a cab in the street and died within ten minutes before he reached the hospital his death should be credited to the locality in which the accident occurred, but if he lived an hour and reached the hospital his death was credited to the locality in which the man lived. They hoped to be able to get over that anomaly. Moreover, the distribution of institution deaths would in future apply to deaths occurring in nursing homes and other private institutions for the treatment of the sick as well as in public institutions. His remarks as to the comparison of causes of death locally and at the central office had been sufficiently answered by other speakers ; they merely intended to try to do what they could, but if the system did not work they would have to give it up. With regard to visitors at watering places, and so on, he did not think the Poor Law settlement as a basis of distribution would be a good one. So far as his information went a period of something like seven years was required for a Poor Law settlement to be established, and certainly to adopt that would cut across the practice with regard to all inmates of institutions who did not come under the Poor Law. The question of publishing tables of a more or less extended nature for large towns was not intended to be referred to one way or the other in the Paper. The stages by which the cards stating the causes of death were dealt with were described at the beginning and the end ; but the intermediate stages in which extended tables would be prepared for counties and probably for county boroughs were omitted. He quite appreciated the cogency of the reasoning urged by Mr. Hooker for his suggestion that the fertility questions should be put with regard to widows and widowers as well as married persons in respect of the table, for linking up the fertility of the past with that

¹ See Greenwood, "Arris and Gale Lectures," *British Medical Journal*, April, 1908.

of the present time ; but he was afraid there were practical reasons of convenience, both from the point of view of the householder and of the compilers of the table which would tell against that, and the Census Act would probably contain no authorisation of the questions in respect to the widowed. He would point out that the number, although absolutely small owing to the remoteness of the time to which some of the questions referred, would be larger, because the age of the husband was not used to subdivide the numbers being dealt with. Consequently the number of classes into which the returns would be divided would be much smaller than in the case of women under the age of 45. With regard to the cessation of fertility at 45 or 55, one did not mean to suggest for a moment that fertility might not continue beyond 45 ; that was merely taken as a convenient average age at which, in general, fertility might be looked upon as ceasing.

The PRESIDENT, in concluding the discussion, said he was glad to think that his term of office ended with a Paper which had excited so much interest. They might congratulate themselves in that the last subject placed before them this Session was one in which they had been practically concerned, and regarding their suggestions which had been met more than half way by the government authorities.

The PRESIDENT then announced that, as the result of the ballot, M. Eugène Tisserand and Count Yanagisawa had been elected Honorary Fellows.

The following Candidates were elected Fellows of the Society :—

Edwin Cocker.

| Alfred North Whitehead, F.R.S.

REPORT OF THE COUNCIL

For the FINANCIAL YEAR ended December 31, 1909, and for the SESSIONAL YEAR ending June 21, 1910, presented at the SEVENTY-SIXTH ANNUAL GENERAL MEETING of the ROYAL STATISTICAL SOCIETY, held at the Rooms of the Royal Society of Arts, John Street, Adelphi, London, on June 21, 1910.

THE Council have the honour to submit their Seventy-sixth Annual Report.

The lamented death of His Majesty King Edward VII deprives the Society of its Patron. The Council at their meeting on May 19 drew up the following Address to His Majesty King George V, which was submitted to the ordinary meeting of Fellows on May 24, and duly forwarded :—

“ TO THE KING’S MOST EXCELLENT MAJESTY :

“ MAY IT PLEASE YOUR MAJESTY,

“ We, the President and Council representing the general body of Fellows of the Royal Statistical Society, humbly approach Your Majesty with an assurance of our loyal attachment to Your Majesty’s Throne and Person, and of our most respectful condolence with Your Majesty and the Royal Family on the sorrowful occasion of the death of our beloved Sovereign His Majesty King Edward. We desire humbly to express the profound grief which we, in common with our fellow-subjects throughout the Empire, feel in the loss of a Sovereign whose life was devoted to the furtherance of the welfare of His People, and whose reign will be ever memorable in the history of the British race.

“ The Royal Statistical Society recalls with grateful pride that His late Majesty was graciously pleased as Prince of Wales to

“ occupy for nearly thirty years the position of Honorary President
 “ of the Society, and that during the whole of his reign He was
 “ its Patron.

“ We desire to present our respectful and dutiful congratulations
 “ to Your Majesty on your accession, and to express our gratitude
 “ for the interest which Your Majesty has graciously shown in
 “ the affairs of the Royal Statistical Society and the progress of
 “ statistical knowledge. For the last nine years Your Majesty
 “ has been Honorary President of the Society, and we remember
 “ with special appreciation Your Majesty’s participation in the
 “ reception by the Society of the International Statistical Institute
 “ in London in 1905, and the inspiring address delivered by
 “ Your Majesty, as Honorary President, on that occasion. We
 “ venture to express the hope that the Society may continue to
 “ merit and receive Your Majesty’s gracious patronage.

“ We earnestly pray that the favour of Heaven may rest on
 “ Your Majesty and Your Royal Consort, and that it may please
 “ Almighty God to vouchsafe to Your Majesty a long, peaceful
 “ and beneficent reign over the populations and Territories united
 “ in allegiance to the British Crown.

“ Given under the Common Seal of the Royal Statistical Society,
 “ May 24, 1910.”

The roll of Fellows on December 31 last as compared with the average of the previous ten years was as follows :—

Particulars.	1909.	Average of the previous Ten Years.
Number of Fellows on December 31	825	906
Life Fellows included in the above.....	167	176
Number lost by death, withdrawal, or default	82	52
New Fellows elected	52	49

Since January 1 last, 29 new Fellows have been elected, and the Society has lost 31 by death, resignation, or default, so that the number on the list, excluding Honorary Fellows, on June 21, 1910, is 823.

The Society has to deplore the deaths since June last year of the following Honorary Fellows: Monsieur J. J. Emile Cheysson (France), Dr. Franz Ritter von Juraschek (Austria), N. G. Pierson (Netherlands), Mr. William Henry Archer, K.C.P., K.S.G. (Victoria), and of the undermentioned Fellows :—

		Date of Election
<i>d</i>	* Boileau, Lieut.-Col. John Peter H., M.A., M.D.	1884
	Borrajo, Edward M.	1907
	Earnshaw, Jacob	1888
<i>c d p</i>	*Giffen, Sir Robert, K.C.B., LL.D., F.R.S.	1867
	Goad, Charles E.	1888
	Griffith, Col. Edward C.	1868
	Hollams, Sir John	1888
<i>d</i>	Lee, Arthur	1899
	McKewan, William	1878
<i>d</i>	*Molloy, W. R. J.	1888
	Ripon, The Most Hon. the Marquess of, K.G., F.R.S.	1873
	Slade, Alfred T.	1888
	*Smith, Charles, M.R.I.A.	1878
	Williams, David	1906
	Willans, J. W.	1860
	* Life Fellow.	
	<i>c</i> Ex-Member of the Council.	
	<i>d</i> Donor to the Library.	
	<i>p</i> Contributed Papers to the Society's Transactions.	

By the death of Sir Robert Giffen the Society loses one of its most distinguished Fellows. He joined the Society in 1867, and was for thirty-nine years a member of Council. From 1874 to 1881 he held the position of Honorary Secretary, and from 1876 to 1891 that of Editor of the Journal. He was elected President of the Society in 1882, and served in that capacity for two years. In latter years his attendance at the meetings of the Society had been less frequent, but he remained an Honorary Vice-President until his death.

The Council recognise with gratification the evidence of his keen interest in the Society afforded by the fact that under his will the Society has a residuary interest in his estate.

Since June, 1909, the following new Fellows have been elected:—

Akers, Alfred.	Hart-Synnot, R. V. O., D.S.O.
Bagnall, Bernard T. S., A.C.A.	Haslewood, Bernard.
Barker, J. Ellis.	Haw, George.
Bennett, Samuel.	Heath, John St. George C.
Beresford, Frank.	Hirst, Francis W.
Breul, Ernest D. T. E.	Hobson, C. K.
Buchanan, Dr. James, M.A.	Hope, E. W., M.D., L.R.C.P.
Carson, H. C.	Jack, H. J.
Clark, Albert Hawkins.	Johnson, Edward S.
Clark, Dr. Charles C.	Kahn, Stephane, F.R.G.S.
Cocker, Edwin.	Ker, William P.
Crammond, Edgar.	Laughton, A. M.
Dale, Augustus Charles, I.S.O.	Lubbock, the Hon. Harold F. P.
Darton, Oscar, F.C.A.	Marriner, F. John.
De Than, M. Albin.	Millard, Percy William.
Duveen, Edward J.	Morgan, H. Allan.
Fabini, Herman V.	Morison, Hector McDonald, A.C.A.
Gaskell, Thomas P., M.I.C.E.	Nathan, Eric B., A.I.A.
Greenwood, Major, M.R.C.S.	O'Malley, L. S. S., I.C.S.
Harrison, C. W. Francis, F.R.G.S.	Osborne, James H., F.R.G.S.

Pattin, H. Cooper, M.A., M.D.
 Peacock, Walter.
 Rea, P. M.
 Sharp, Clifford D.
 Snow, E. C.
 Turnor, Christopher.
 Verney, Harry, B.Sc.

Walsh, Robert, F.C.A.
 Watt, James, F.F.A.
 Whitehead, Alfred N., F.R.S.
 Wilbur, Dr. Cressy L.
 Williams, Sydney Fairs.
 Young, Arthur Stanley, F.I.A.

Two Honorary Fellows, M. Eugène Tisserand (France) and Count Y. Yanagisawa (Japan), have also been elected.

The financial condition of the Society is shown in the Auditors' Report appended hereto, the value of the invested stock held by the Society being taken at current prices. On January 1, 1909, there was a balance from 1908 of 46*l.* 5*s.* 9*d.*; the receipts of the year were 2,060*l.* 1*s.* 6*d.*, and the expenditure, including 91*l.* 19*s.* 4*d.* for Part 5 of the Index to the Journal, was 2,053*l.* 15*s.* 3*d.* The sum of 315*l.* 1*s.* 5*d.* was invested, and a balance of 152*l.* 10*s.* 7*d.* remained in the current account on December 31, 1909. Details for the last twenty-five years are given in Appendix B. The cordial thanks of the Council have been tendered to the Auditors for their honorary services.

The contributions to the Society's transactions presented at the Ordinary Meetings of the Session, 1909-10, have been as follows:—

1909.

I.—November 16 BAINES, Sir J. A., C.S.I. *Presidential Address*. The Recent Growth of Population in Western Europe; an Essay in International Comparison.

II.—December 14.... { GARNETT, Dr. W., M.A. The Representation of Examination Results in Two or Three Dimensions.
 WEBB, A. D., B.Sc. Some Difficulties met with in International Statistical Comparisons.
 YULE, George Udny. The Distribution of Deaths with Age, when the Causes of Death Act Cumulatively, and similar Frequency Distributions.

1910.

III.—January 18 VERNEY, H., B.Sc. The Recent Considerable Increase in the Number of Reported Accidents in Factories.

IV.—February 15 FLUX, A. W., M.A. Urban Vital Statistics in England and Germany.

V.—March 15 { HOOPEE, Wynnard. Notes on the Financial System of the German Empire.
 VIGOR, H. D., B.Sc. The Increased Yield per Acre of Wheat in England Considered in Relation to the Reduction of the Area.

VI.—April 19 ROSENBAUM, S., M.Sc. The General Election of January, 1910, and the Bearing of the Results on Some Problems of Representation.

- VII.—May 24 WOOD, G. H. Statistics of Wages in the Nineteenth Century, Part XIX. The Cotton Industry. Section V. Changes in the Average Wage of all Employed, with some Account of the Forces Operating to Accelerate or Retard the Progress of the Industry.
- VIII.—June 21 STEVENSON, Dr. T. H. C. Suggested Lines of Advance in English Vital Statistics.

On two occasions more than one paper was read. At the meeting in December, contributions of short papers were specially invited, and the Council propose, as opportunity offers, to repeat this arrangement, which appears to have met with general approval.

The thanks of the Society are due to those Fellows who have contributed so largely by the reading of papers to the maintenance of public interest in the Society's proceedings.

The growth of the Society's Library, and the extent to which it is used by Fellows of the Society and others, are shown in Appendix C. The monthly average number of books lent during the sessional year 1908-09 was 80, and that of borrowers 41. The total number of Fellows and others using the Library during the sessional year was 1,102, or an average of 92 persons per month.

In the past year the work of the Census Committee has been continued upon the lines laid down since its appointment in 1907. It is noteworthy that among other changes in the schedule of the Census (Great Britain) Bill, 1910, a return is required, in the case of married persons, of the duration of the marriage, and the number of children thereof born and surviving, and also that the number of rooms inhabited must in all cases be stated. Both these requirements were recommended in the Report of the Census Committee (Section A, Parts I and II). In recognition of these provisions the Council directed that a letter of thanks should be addressed to the Prime Minister, the Chancellor of the Exchequer, and the President of the Local Government Board. An expression of regret was, however, added, that provision was not made "for a "Quinquennial Enumeration of the simple character recommended "by the Society on several occasions," and the request was made "that the Census Bill may be extended to provide for such an "enumeration in 1916." In answer to a question subsequently put by Sir Charles Dilke in the House of Commons, the President of the Local Government Board stated that he was "not without hope "that a system of quinquennial censuses may come to be adopted." On the occasion of the second reading of the Census Bill on

June 14, the President of the Local Government Board further stated that he had hoped a quinquennial Census might be provided for in the present Bill, but the Treasury were not prepared to sanction such a step. If the Census worked satisfactorily, however, there would be ample opportunity before the quinquennial period came round again to press the matter upon the Treasury.

The Report of the Special (Housing and Development) Committee was adopted by the Council on July 15, 1909, and as a result of its recommendations the following changes have been made:—

(1.) A new lease has been obtained of the Society's present premises for a period of twenty-one years.

(2.) From the commencement of the present year, the Journal is published monthly during the Session, and not, as formerly, quarterly during the calendar year. In connection with its more frequent issue the Council are endeavouring to extend the scope and increase the usefulness of the Journal, and a new feature has been introduced by the inclusion in each number of current notes on statistical subjects. In future the number of monthly issues, which will appear on or about the 15th of each month, will be eight, although during the present Session not more than seven will have appeared in all, since the first volume of the new series began with the January number. The first number of the second volume will appear in December.

(3.) A thorough redecoration and re-arrangement of the Society's house will be carried out before the commencement of the next Session. It is intended to make the Library, Reading Room, and other rooms more convenient for the use of Fellows, and it is hoped that the Society's house will be more generally resorted to by them in the future than in the past.

(4.) The Society's Rooms and Library have remained open during the Session until 7 p.m. on week days, and 2 p.m. on Saturdays. So far the use made of the Library by Fellows during the extended hours has not been large, but it is expected that it will increase as the facilities become better known.

(5.) Mr. C. M. Kohan has been appointed Assistant Secretary, on the resignation of Mr. J. H. Magee. The duties and responsibilities of the Assistant Secretary, especially in connection with the preparation of the Journal, have been considerably enlarged.

Under the conditions laid down in the regulations for the award of the Guy Medal, the Council have awarded a Guy Medal in Silver to Mr. G. H. Wood.

The Council have made no award of the Howard Medal for the Session 1908-09.

The following Fellows (nominated in accordance with By-law 14) are recommended for election as President, Council, and Officers of the Society for the Session 1910-11 :—

PRESIDENT.

*The Right Hon. Lord George Hamilton, G.C.S.I.

COUNCIL.

George R. Askwith, K.C., C.B.	A. W. Waterlow King, J.P.
Arthur H. Bailey, F.I.A.	Bernard Mallet.
Edward Bond, M.A.	Sir Theodore Morison, K.C.I.E., M.A.
Arthur L. Bowley, M.A.	Sir Shirley F. Murphy, F.R.C.S.
Sir Edward W. Brabrook, C.B., V.-P.S.A.	Arthur Newsholme, M.D.
*Professor S. J. Chapman, M.A.	L. L. Price, M.A.
William H. Clark, C.M.G.	*Sir Lesley Probyn, K.C.V.O.
*Sir Ernest Clarke.	R. H. Rew.
Timothy A. Coghlan, I.S.O.	*Simon Rosenbaum, M.Sc.
Reginald Dudfield, M.A., M.B.	Charles P. Sanger, M.A.
Sir William C. Dunbar, Bart., C.B.	William N. Shaw, D.Sc., F.R.S.
Alfred W. Flux, M.A.	Professor William Somerville, D.Sc.
*H. Fountain.	Thomas A. Welton, F.C.A.
Edgar J. Harper.	*Robert A. Yerburch, M.P.
Noel A. Humphreys, I.S.O.	G. Udney Yule.

Those marked * are proposed as new Members of Council.

TREASURER.

Sir Richard Biddulph Martin, Bart. (*Hon. Vice-President*).

HONORARY SECRETARIES.

R. H. Rew (*and Foreign*). G. Udney Yule. W. H. Clark, C.M.G.

The abstract of receipts and payments, and the estimate of assets and liabilities on 31st December, 1909, together with the report of the Auditors on the accounts for the year 1909, are appended.

Signed on behalf of the Council,

(Signed) J. A. BAINES,
President.

R. H. REW,
G. UDEY YULE, } *Hon. Secretaries.*
W. H. CLARK, }

(Signed) C. M. KOHAN,
Assistant Secretary.

APPENDICES TO ANNUAL REPORT.

A (i).—ABSTRACT of RECEIPTS and PAYMENTS for the YEAR ending
DECEMBER 31, 1909.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance in Bank on Deposit, December 31, 1908	£300	- -	Rent and Taxes:—		
Balance in Bank on Current Account, December 31, 1908	160	12 7	Rent	£356	5 -
Balance of Petty Cash Account.....	-	4 2	Taxes	42	18 -
„ Postage Account	-	9 -		399	3 -
		461 5 9	Less Sub-let ...	25	- -
Dividends on 2,371½ 6s. Consols, Account A	56	1 4		374	3 -
Dividends on Consols, Account B, (Guy Bequest) ...	256	12 6	Fire, Lights, and Water	48	19 11
Dividend on G.N.R. Stock.....	37	18 4	Furniture and Repairs	16	4 8
Interest on Deposit at Bank.....	3	15 7	Salaries and Wages	550	4 -
		354 7 9	“Journal,” Printing	£552	12 5
Annual Subscriptions:—			„ Shorthand } Reporting }	29	12 -
40½ Arrears	85	1 -	„ Literary } Services }	59	9 6
567 for year 1909 ...	1,190	14 -			641 13 11
15 in Advance for 1910.....	31	10 -	Ordinary Meeting Expenses	15	14 3
		1,307 5 -	Advertising	32	10 3
622½			Postage and delivery of “Journals” and Index	62	3 7
			Stationery and Sundry Printing...	71	17 5
Compositions	84	- -	Library	99	2 9
“Journal” Sales	273	7 9	Incidental Expenses	47	12 2
Advertisements in “Journal”	30	- -	Medals.....	1	10 -
Library. R. Econ. Soc.	11	1 -			1,961 15 11
			Index to “Journal” Part 5	£91	19 4
			Purchase of Consols, Account B (Guy Bequest) ...	256	12 6
			Purchase of Consols, Arrears of Interest	58	8 11
					407 - 9
					2,368 16 8
			Balance on Deposit at Bank, December 31, 1909—		
			Current Account ...	£151	8 6
			Petty Cash	-	3 5
			Postage	-	18 8
					152 10 7
Total	£2,521	7 3	Total	£2,521	7 3

(Signed)

“February 1, 1910.

“CHAS. ATKINSON,
“A. H. BAILEY,
“S. CHAPMAN,

} Auditors.”

(ii).—ESTIMATE of ASSETS and LIABILITIES on DECEMBER 31, 1909.

LIABILITIES.			ASSETS.		
	£	s. d.		£	s. d.
Messrs. Harrison and Sons, for } December "Journal"	113	14 10	Cash Balances	152	10 7
Miscellaneous Accounts	205	19 9	2,371 <i>l.</i> 6 <i>s.</i> Consols } (General Fund). } (Price, December } 31, 1909, 83 <i>l.</i>) }	1,968	3 7
15 Subscriptions received in ad- } vance	31	10 -	1,000 <i>l.</i> G.N.R. Pre- } ferred Converted } Ordinary Stock } (Price, December } 31, 1909, 93 <i>l.</i> 10 <i>s.</i>) }	935	- -
Balance in favour of the Society } (Exclusive of (1) Books in } the Library; (2) Journals in } Stock; and (3) Pictures, Fur- } niture, and Fixtures)	12,013	18 3	11,061 <i>l.</i> 17 <i>s.</i> 3 <i>d.</i> Con- } sols (Guy Bequest). } Price, December } 31, 1909, 83 <i>l.</i>) }	9,181	7 2
				12,084	10 9
			Arrears of Subscriptions re- } coverable (say 40)	84	- -
			Sundry debtors	44	1 6
	£12,365	2 10		£12,365	2 10

A (iii).—BUILDING FUND (ESTABLISHED *July* 10, 1873): STATEMENT
on DECEMBER 31, 1909.

This Fund is invested in Metropolitan Consolidated 3*l.* 10*s.* per Cent. Stock. On December 31, 1908, the Fund was invested in 478*l.* 18*s.* 4*d.* Stock. With the dividends received during 1909, additional Stock to the amount of 15*l.* 11*s.* 7*d.* was purchased by the Bank of England for the Society. Accordingly, on December 31, 1909, the total investment amounted to 494*l.* 9*s.* 11*d.* Stock.

(Signed)

" CHAS. ATKINSON,
" A. H. BAILEY,
" S. CHAPMAN, } *Auditors.*"

" *February* 1, 1910.

A (iv).—"REPORT OF THE AUDITORS FOR 1909.

"The Auditors appointed to examine the Treasurer's Accounts for the Year 1909,

"REPORT:—

"That they have compared the Entries in the Books with the several Vouchers for the same, from January 1 to December 31, 1909, and find them correct, showing the Receipts (including a Balance of 461l. 5s. 9d. from 1908) to have been 2,521l. 7s. 3d., and the Payments 2,368l. 16s. 8d., leaving a Balance in favour of the Society of 152l. 10s. 7d. on December 31, 1909.

"They have also had laid before them an Estimate of the Assets and Liabilities of the Society at the same date, the former amounting to 12,365l. 2s. 10d., and the latter to 351l. 4s. 7d., leaving an excess of Assets over Liabilities of 12,013l. 18s. 3d., exclusive of (1) Books in the Library; (2) Journals, &c., in Stock; and (3) Pictures, Furniture, and Fixtures.

"They have verified the Investments of the Society's General Funds (2,371l. 6s. Consols + 1,000l. G.N.R. Stock); the Guy Bequest (11,061l. 17s. 3d. Consols); the Building Fund (494l. 9s. 11d. Metropolitan Consolidated Three and a Half per Cent. Stock); and also the Banker's Balance (151l. 8s. 6d.); all of which were examined and found correct.

"They further find that at the end of the year 1908 the number of Fellows on the list was 855, which number was reduced in the course of the year to the extent of 82, by Death, Resignation, or Default; and that 52 new Fellows were elected or restored to the list, leaving on the list on December 31, 1909, 825 Fellows of the Society.

(Signed)

" CHAS. ATKINSON,	} Auditors.
" A. H. BAILEY,	
" S. CHAPMAN,	

"February 1, 1910."

B.—Statement of the Condition of the Society in the last Twenty-five Years 1885-1909.

Year.	Number of Fellows on December 31.	Number of Life Fellows included therein.	Losses during Year by Deaths, &c.	Gains by Election, &c., during Year.	Income from				All Sources.	Expenditure.			Amount Invested on December 31.	Year.	
					Annual Subscrip- tions.	Composi- tions.	Journal Sales.	Investments and other Sources.		Total.	Of which				
											£	£			£
'885....	928	148	55	74	1,462	63	188	349	2,062 ^e	2,070 ^b	£ 625	£ 27	2,500	1885	
'86....	943	156	70	85	1,583	231	180	92	2,086	2,106 ^d	735	32	2,500	'86	
'87....	977	160	59	93	1,621	126	188	94	2,029	2,135 ^e	609	87	2,500	'87	
'88....	1,059	172	58	140	1,686	334	171	101	2,292	2,003	711	58	2,500	'88	
'89....	1,060	175	69	70	1,678	126	229	82	2,115	2,060 ^f	623	146	2,500	'89	
1890....	1,063	177	65	68	1,764	84	155	94	2,097	2,096 ^a	567	68	2,900	1890	
'91....	1,019	172	80	36	1,707	42	146	181	2,076 ^g	1,957 ^h	582	172	2,900	'91	
'92....	994	171	70	45	1,634	84	158	104	1,980	1,883 ⁱ	539	94	2,900	'92	
'93....	964	176	66	36	1,560	124	128	92	1,904	1,921	578	63	2,900	'93	
'94....	933	180	67	36	1,491	105	152	82	1,830	1,904	649	75	2,900	'94	
'95....	928	180	59	54	1,468	63	180	82	1,793	1,823 ^j	576	56	2,900	'95	
'96....	910	181	48	30	1,478	42	168	84	1,772	1,787	571	44	2,900	'96	
'97....	892	182	58	40	1,472	145	157	83	1,857	1,986 ^k	650	50	2,900	'97	
'98....	878	180	57	43	1,451	115	182	105	1,853	1,825	609	55	3,300 ^l	'98	
'99....	896	181	44	62	1,432	95	167	127	1,821	1,805	564	33	3,300	'99	
1900....	923	179	36	63	1,514	21	189	148	1,872	1,817	521	53	3,300	1900	
'01....	926	177	49	52	1,464	63	211	129	1,867	1,823	518	42	3,300	'01	
'02....	932	177	52	58	1,504	21	255	152	1,932	1,839	543	73	3,300	'02	
'03....	939	174	49	56	1,517	84	293	151	2,045	1,875	593	91	3,300	'03	
'04....	925	175	58	44	1,407	124	253	152	1,936	1,931 ^a	521	92	3,400	'04	
'05....	911	178	59	45	1,465	168	220	220	2,073	2,074 ^m	665	67	11,975 ⁿ	'05	
'06....	891	177	63	43	1,464	82	225	408	2,274 ^o	1,988	645	95	11,449	'06	
'07....	861	172	63	33	1,363	82	327 ^q	408	2,180	2,401 ^p	571	87	11,746	'07	
'08....	855	170	46	40	1,339	84	254	494 ^r	2,171 ^r	2,428 ^s	602	92	11,920	'08	
'09....	825	167	82	52	1,307	84	273	396	2,060	2,369 ^t	611	99	12,084	'09	

^a Includes purchase of Government stock.^b Includes expense of moving to new premises.^c Includes Dr. Guy's legacy of 250l.^d Includes cost of Catalogue and Index, and of Charter.^e Includes cost of part iv of Index to *Journal*.^f Includes outlay for Guy Medal and for binding "The Times."^g Includes cost of Subject-Index to *Journal*.^h Includes 400l. G.N.R. stock, purchased with Mr. J. Heywood's Legacy of 500l.ⁱ Includes the Guy Bequest. The total invested is now valued at current prices.^j Includes Mrs. Lovegrove's legacy of 100l.^k Includes outlay for drainage repairs.^l Includes cost of doing up interior of premises.^m Includes 100l. to International Statistical Congress Fund.ⁿ Including 126l. for sale of books.^o Includes purchase of 600l. G.N.R. Stock.^p Includes special sales. ^r Includes Sanford Bequest, 100l.^q Includes 100l. for Catalogue and 288l. for purchase of Stock.^s Includes 126l. for Index and 315l. for purchase of Stock.

C.—Numbers of Books Added to the Library and Lent, and Numbers of Borrowers from the Library in the Sessional Years 1907-08, 1908-09, and 1909-10.

Months,	Works Received.*			Books Lent.						Borrowers.			Fellows and Visitors using the Library.				Months.
	1907-08.	1908-09.	1909-10.	1907-08.		1908-09.		1909-10.		1907-08.	1908-09.	1909-10.	1907-08.	1908-09.	1909-10.	Called after 5 p.m., or remained after 5 p.m., 1909-10.	
				Works.	Vols.	Works.	Vols.	Works.	Vols.								
July	447	440	461	62	74	72	97	69	89	34	36	36	72	90	95	—	July
August				52	66	58	63	69	81	36	36	43	48	96	81	—	August
September ..				37	50	63	80	66	69	22	37	31	53	77	65	—	Sept.
October	459	482	465	59	70	74	90	86	104	44	41	53	77	98	104	1	October
November ...				88	119	99	118	98	124	52	45	63	81	77	110	8	Nov.
December ...				71	86	79	90	75	104	41	39	45	62	97	82	10	Dec.
January	520	510	167	81	98	68	78	94	115	42	29	57	81	64	92	3	January
February				74	89	89	106	86	92	48	54	44	76	95	76	4	February
March				98	125	94	118	96	118	51	44	54	110	101	114	18	March
April	512	550	732	60	81	91	105	92	119	38	44	51	77	88	105	14	April
May				76	100	80	104	74	89	47	51	50	87	109	102	9	May
June				41	51	97	112	76	98	26	43	50	97	110	121	18	June
Sessional year....	1,938	1,982	1,825	799	1,009	964	1,161	981	1,202	481	499	577	921	1,102	1,147	85	{ Sessional year
Monthly average	161	165	152	66	84	80	96	82	100	40	41	48	76	92	95	10	{ Monthly average

* These figures represent the number of works entered during the year under "Additions to Library" in the *Journal*, and not the number of separate volumes; they are exclusive of about 170 weekly, monthly, and quarterly periodicals regularly received.

PROCEEDINGS of the SEVENTY-SIXTH ANNUAL GENERAL MEETING,
held on June 21, 1910.

SIR J. ATHELSTANE BAINES, C.S.I., President, in the Chair.

THE Minutes of the previous Annual Meeting were confirmed.

The PRESIDENT announced that under the conditions laid down for the award of the Guy Medal the Council had awarded a medal in silver to Mr. G. H. Wood for his Paper read before the Society on May 24, 1910, on "The Statistics of Wages in the Nineteenth Century," and for the series of Papers on the same subject contributed by him to the *Journal* of the Society.

The Report of the Council was taken as read.

The PRESIDENT moved "that the Report of the Council, the Abstract of Receipts and Payments, the Estimate of Assets and Liabilities, and the Report of the Auditors, be adopted, entered on the Minutes, and printed in the *Journal*."

Mr. E. H. GODFREY said he had much pleasure in seconding the motion. As one connected with statistics in Canada, he begged to say that all those in the outlying portions of the Empire very much appreciated the labour of home statisticians in working out the best statistical methods on the most approved principles. They also very much appreciated the efforts of the Society to bring the *Journal* more up to the needs of the present day.

The PRESIDENT, in putting the motion, said it was unfortunate that the wasting disease which had affected them for some years still continued. He must repeat the request made annually by the President that all the Fellows should do what they possibly could to stop this decline, so that the membership of the Society might gradually recover the numerical position in which it stood when he first came back from India in 1890.

The motion was then put and carried unanimously.

The HONORARY SECRETARY (Mr. REW) having read out the list of defaulters, the PRESIDENT declared that they had ceased to be Fellows of the Society.

The Ballot was then taken, and the Scrutineers (Miss B. L. HUTCHINS and Mr. H. D. VIGOR) reported that the proposed President, Council, and Honorary Officers for the ensuing session had been unanimously elected.

The HONORARY SECRETARY announced that the subject selected for essays in competition for the Howard Medal in 1910-11, was "A statistical review of the variations during the last twenty years in the consumption of intoxicating drinks, and in convictions for offences connected with intoxication; with a discussion of the causes to which these variations may be ascribed."

Sir ERNEST CLARKE proposed a cordial vote of thanks to the President, Council, and Officers for their services during the past year. With regard to the President, he said those thanks were tinged with regret, because they were exceedingly sorry that his period of office had come to an end. They all felt that he was one of themselves, and were proud to see a man who had fulfilled so many useful functions in connection with the Society ascend the Presidential chair and conduct the business with such distinction as he had done. During the past year the Society had every reason to congratulate itself on its President's work, and particularly upon the introduction of short Papers and the useful discussion to which they had led; for there were many members of the Society who were a little apprehensive of preparing a "full-dress" Paper, but were glad of the opportunity of putting their views on some small section of statistical work before their fellow members, with a view to getting a public discussion thereon. In every other respect the year had been a great success. The President had alluded to the loss of members, but it would be seen that the number who had died this year was much larger than usual.

Dr. GREENWOOD, in seconding the motion, said there were a large number of Fellows who, like himself, were specialists in certain small departments; and one of the pleasant features of the Society was that they had the opportunity of hearing statistical subjects brought forward with which they were totally unacquainted, and of meeting one another in different departments of statistics and exchanging ideas. The Council were heartily to be congratulated on the skill with which the Papers had been chosen to represent the various interests in the statistical world.

The motion having been carried unanimously,

The PRESIDENT, on behalf of his colleagues and himself, thanked the Fellows for their appreciation, and said that, speaking for himself, the year had passed very quickly and agreeably. His work had been materially facilitated by the help he had received from his colleagues, especially from Mr. Rew, Mr. Yule, and Mr. Kohan, the Assistant Secretary, who had been of great assistance. He hoped that next year, when his very distinguished successor would be in the chair, they might have a continuance of the series of short Papers which he agreed with Sir E. Clarke were of importance and had offered opportunities for useful discussion.

MISCELLANEA.

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- I.—*The Sea Fishery Statistics of Germany : a Summary of an Address on the Present State of the Sea Fishery Statistics of Germany and of the Statistical Methods Employed in International Sea Investigation.* By Professor Dr. HENKING (Berlin).¹

As far as statistics of catches are concerned, it may be said that a system of such statistics has been carried out for a long time by several coastal countries in Germany. In the first rank I must mention Prussia, where statistical returns are made all the year round by the Government Fishmaster, and have, for many years, been published in the *Report of the German Sea Fisheries Society*. These concern, on the one side, the North Sea, and, on the other side, most of the provinces of the Baltic. Statistics of the Baltic are collected by the Prussian Fishmasters from East Prussia to Pommerania; Schleswig-Holstein, however, is left out altogether. Oldenburg compiles statistics of only a portion of its fisheries, namely, the Weser fisheries. No sea fisheries statistics are published relating to Bremen, and this was originally the case with Hamburg. But things have changed since Hamburg has appointed a special fishery officer, and special care is devoted to statistics which are published in the form of a return. In Lübeck the fishery statistics are collected by the police officials, while the fishery overseer is responsible for those in Travemünde. The latter are published by the Fishmaster Hinkelmann (Kiel) in the yearly report of the police officials.

In Mecklenburg there does not seem to be a complete system, the Fishmaster in Wismar possessing the only returns that will bear collating. They are not well known, and do not appear to have been published.

I must also mention that the Prussian Statistical Office makes no special records, except, for example, in the statistical year book for the Prussian State, and that only gives what the chief fishmasters supply. It is clearly evident, therefore, that by collating the various returns of the several states we cannot obtain a series of fishery statistics for the German coasts, seeing how many gaps would appear therein.

¹ Translated by Mr. A. T. A. Dobson from the Special Supplement to the *Proceedings of the German Sea Fisheries Society*, No. 10, 1909.

In the year 1906, the Imperial Statistical Office effected a reorganisation, and established a general system of statistics for German sea fisheries. It is in regard to the object of these statistics, which form the basis of market statistics, that it was said when this system was organised :—²

“With reference to the all-important fact that the German sea fisheries, especially the high sea fisheries, have during the last year developed to such a large extent, it is recommended that reports should be made of these sea products as they cross the German frontier, in order that they may be of service in the preparation of the sea fisheries statistics now obtained over a series of years.”

It was in this way that the statistics of the Imperial Statistical Office came into existence.

I must here also explain—because it is an important factor in the consideration of these statistics—how the system is being carried out. It has already been shown that the statistics are obtained in the following manner; in Section 41 of the statutory proceedings of February 7, 1906, it is stated :—³

“German fishermen and the masters of German vessels have to make a report of seals, whales, and other sea creatures which they have caught and brought to land, as well as of the products obtained therefrom, no matter whether the creatures were caught on the German coasts or out at sea (in the coastal, sea and high-sea fisheries). A notification given verbally, month by month, is sufficient, and the later special information proceeding from the ship’s log-book or obtained by the direction of the chief land finance officials is forthcoming.”

The “verbal and monthly information” here spoken of is very typical. This monthly information is published in the reports of the Imperial Statistical Office. I assume that this is a well-known fact.

Furthermore, the German Sea Fisheries Society occupies itself with a collection of sea fisheries statistics, without taking into account the question of the boundaries of the various states. It proceeds on lines different from those adopted by the Imperial Statistical Office, and I must be allowed to give a somewhat elaborate interpretation of the Society’s system, because I think this system of statistics is not so well known as the other.

(1.) *North Sea*.—I must begin by saying that I am laying before you the manner in which the statistics are collected by the steam fishing boats belonging to the society and then collated.

These statistics relating to steam fishing boats have for a great number of years been in the control of the German Sea Fisheries Society. The Fishery Inspector at Geestemünde gave us a splendid method by which these statistics could be collected, so that an excellent basis was formed from which to arrive at a first-class system of statistics. Thence we received, and still continue to receive, not only monthly summaries of the records of catch—

² Reichstag. 11 Legislaturperiode II. Session 1905-06. Nr. 37. (November 28, 1905.)

³ *Gesetz betreffend Statistik des Warenverkehrs. R.=G.=Bl. Berlin, 1906, s. 104 ff.*

that is essential in view of the instructions of the Imperial Statistical Office—but also the exact statistical returns of the catch produced by each voyage. We receive a form from each separate steamer after each voyage, on which is given the catch which it has on board and brings to port. This form is given by the captains to the market auctioneer or handed in at the harbour office, duly filled in with the quantities which, according to their estimation they bring to port.

In later years we have gone further and have supplemented these valuations to such an extent, that the exact weights given at the market of each kind of fish are obtained. Moreover, we do not confine ourselves to the total quantity of each species found in the several catches of one vessel, but take into consideration the quantities of each trade category. Of one kind of fish there will be more trade categories than of another kind, and we are enabled to give the exact weight of each of these trade categories.

In this way, by obtaining from all German fishing steamers the special returns above described, we have an unusually complete system of fishery statistics.

It is of particular importance in these statistics that we should obtain information not only with regard to the quantities, but in quite a number of other respects as well. In the first place the name of the steamer is given. That is of less importance because we do not wish to control what the individual steamer lands. The grand total alone is of interest. The forms further contain records as to the time of departure on the voyage in question and the time of arrival of the steamer. We obtain also not only the time of year at which the vessel fished, but even the duration of the voyage, the time of absence from the harbour, and finally the fishing ground. Lastly, there is the possibility of sifting out these returns according to their respective seas; we can deal with them for Iceland, for the Cattegat, for the Skagerak, for the South and North divisions of the North Sea and the Baltic. Their working out offers a clear indication of the productiveness of catches in each individual month; moreover, it not only shows each species separately, but also the different sizes of each species in each month, and on each given fishing ground.

In this manner we can, with this material, make the following different compilations:—

(1.) We can show a total yearly table of the quantities of fresh fish landed by the different vessels in Germany from each sea area. I say intentionally [“different”] not “German” vessels, since we include in our statistics what is landed by foreign vessels at our ports; all steamers, which have given us information as to their catch, are noted. The number of foreign vessels, which come into our calculations, is not really very large. I can give you the figures for them. But in this respect we differ in our returns from those of the Imperial Statistical Office, in that in their returns these foreign vessels remain undistinguished.

(2.) Besides the yearly records of the total catch, we possess yearly statistics of individual fishing grounds. The information

thus afforded is exceedingly important, because we can learn therefrom the value of each of the fish areas.

(3.) Our further inquiries lead us to ascertain the number of vessels which go to produce such a catch, and how many voyages, which may be evolved from the fact that our printed form represents one voyage. We can reckon on an average how much one steamer brings in from one voyage in the several fishing areas. Such an estimate must always be inaccurate, because the distances are unequal, and, moreover, much time is spent upon the journey to the fishing ground and upon the fishing ground itself, and the voyages are all of different length. All this has to be taken into account.

(4.) We also obtain a much better result if we calculate how much is caught per voyage day. For every fishing area we can, from the returns rendered in one month, determine the quantities of fish which were landed in that month; at the same time we obtain from the returns information as to how many days all these voyages together occupied, and we are able to reckon the amount of the catch on an average per voyage day in the month in question, and not only the amount of each species of fish caught, but of each trade category of the same. By this means we come to acquire very detailed information.⁴

By means of these determinations it is possible, with accuracy, to ascertain not only that the catch varies in certain months, but also, whether it fluctuates in the different years, that is, whether it remains stationary or otherwise.

(5.) Seeing that these curves in the course of a year fluctuate so differently, now showing a sudden rise, now a sudden fall, it is possible to conjecture that they indicate the migrations of the fishes concerned. That is certainly known to be the case, and I must demonstrate it by describing to you an example. In the case of a very interesting fish, the hake, we obtain very pretty evidence of a recognised migration. It appears from the diagrams that, in the Skagerak for example, hake is not caught at all during the first four months of every year, and then all at once the catch shoots up to a height. You will observe that this is the case in every one of the years 1902-07. It is as if it was all based upon a scheme. The hake is a southern fish, which is caught in large numbers in the strip of sea from the Portuguese up to the Irish coast. At a given time it appears suddenly in large numbers in the North Sea area, and spreads itself in the Southern North Sea, where, as the diagram clearly shows, during the first five or six months of the year it is entirely or almost entirely absent. In the following months, however, it proves a very good catch and it makes a sudden appearance in the Skagerak. This sudden appearance also causes the catch in the Cattegat to rise in the months of June and July. To a certain extent we can see the same picture for all years, a fact which argues for the accuracy of our statistics. The same

⁴ Diagrams showing the results of these statistics were presented and explained.

state of things reigns on the Great Fisher Bank. In the late autumn a rise in the Skagerak curve again occurs, when it looks as if the fish were migrating back.

I would observe that this simple type of illustrated graph which we have now had before us gives us first-class material, which provides us not only with trustworthy information regarding the total quantities of fish landed in Germany, but also clearly shows us the fluctuations in the catches in the various sea areas and regions. From these, in their turn, the migration of fish can be ascertained, as I have shown in the case of hake. At the same time the curves in the figures point to the fact recognised at all events by the fish trade, namely, that the hake since the years 1902 and 1903 in every sea area shows an inexplicable falling off. Whether this falling off is due to the largely increased efficiency of methods of fishing in our ocean or in the Atlantic Ocean on both sides of the Channel is a matter requiring further proof.

I have laid all this before you in order to prove to you the value and trustworthiness of our statistics.

Nevertheless it is, even so, always open to doubt whether the returns really are accurate. I must therefore explain that we go a step further and make a further test of the result which we obtain from the general statistics prepared from the whole German fishing fleet, by means of the catch-journal, which a number of steamers keep. As far as Geestemünde is concerned, we possess for a number of years the catch-journal of a number of steamers, so that we are in a position to check the accuracy of the returns respecting place of capture, which are shown in our general statistics. We can also test the productiveness of smaller catching operations.

Information similar to that which has been set out above with reference to steam trawlers is to hand regarding the catches of sailing trawlers which land fresh fish. Here the matter is more complicated, because a distinction has to be drawn between dead fish and live fish. Furthermore, the catching-ground is known to us, but the duration of the voyage is a point which is not so easy to ascertain. The skippers do not enter it in their return; moreover, they constantly shift their ports. In spite of this we have sufficient information to work out the catches month by month.

There still remains one point for me to mention. I have already said that we can give account of the several trade categories; in the case of haddock there are five such categories, of plaice and soles even more. Now the question arises—what is there to say about categories? What are we to understand by the relation between large, medium, and small? In that there exists an uncertainty. In order to clear up the point, recourse must be had to the market measurements. We have worked up such measurements for a long period. We have returns which should serve our purpose. In the market those of every trade category are exactly measured up to the largest possible specimen, and in the case of the plaice, which is the first species of fish to come into our calculations, the sex is also determined. We have carried out such measurements as these in the different North Sea ports, in order to obtain some idea of the

North Sea fish supply. They enable us to understand what is meant by the different categories of trade statistics. I will show you what I mean in a diagram, which I laid before the meeting of the International Council for Sea Investigation in London in 1907, and of which I am here making use, in order that I may demonstrate how these measurements can be carried out. We have, in regard to haddock, categories I to V, distinguished one from another, and they have all come from one particular trawler catch and from one particular spot. By means of the measurings we obtain useful information, of what fishes, in this case, categories I, II, III, IV, and V consist. For example, 1,000 fish of one category are measured, and I count 500 under and 500 over a given length, and so I arrive at a mean length which I have called⁵ the median length.⁶ In this example, the large haddock of category I are fish of 44-58 cm. long. The mean length was about 49 cm. I can, therefore, say that this larger category of haddock consisted of haddock which were on an average 49 cm. long, and around this mean size the other large ones group themselves; the second category had a mean length of 44 cm., the third category one of 36 cm., and the categories IV and V one of 30 cm. Upon this question I have acquired fairly positive information as to what conclusions one is to draw between the several trade categories—in these special cases.

In order to be quite clear about the trade categories, we must carry on these measurings on as large a scale as possible at the market.

We acquire, hereby, in addition, a clear picture of the size of fish which every portion of the sea contains. It is a very varied question and one of great importance for continuous fish study.

Such is, generally speaking, the work which we in the German Sea Fisheries Society carry out with reference to fresh fish and the landings of high sea trawlers. We obtain the total quantities, the different trade categories, the place of capture, the number of vessels, the number of voyage days and the catch quantities of the voyages and the voyage day. With these data we can work out all the special information described above. From the fish measurings we can determine the meaning of trade categories, and if we repeat them continuously for several years, we can test whether the size shown in the fish supply in one particular sea area has gone back or has remained stationary. The most important result that we hope to obtain is a comprehension of the variations in the fish supply on the fishing grounds.

But if the statistics of our whole fleet are continued upon the same basis as before, by the calculation of the quantity caught per voyage day or per fishing day, we shall obtain information as to whether the quantities of fish, in spite of the variations in individual years, has shown a tendency to rise or to fall.

⁵ Compare *Third Annual Report of the German Scientific Commission for International Sea Investigation*, p. 150. Also Fourth and Fifth Report of the same series (Berlin, 1908), Heincke and Henking, *Plaice and Plaice Fisheries*, p. 80.

⁶ Compare *Participation of Germany in International Sea Investigation. Annual Report I-V*, Berlin, 1905, 1906, 1908.—*Report on statistical work.*

I must in the next place turn to the *herring* harvest. As far as that is concerned, we have been acquiring a set of catch statistics now for a great number of years, through the agency of Director Van der Laan, which we have published regularly week by week.

We have made experiments with a view to furthering our knowledge of the herring catches, and it is my duty to report to you how very much nearer we are to-day to our goal. In connection with the herring fisheries, we stand in a close relationship with the fishery protection ships of the Imperial Navy, which, whenever a herring haul has taken place, ply to and fro among the herring boats; we have therefore made arrangements with the Commanders of H.M.S. "Zieten" and of the torpedo boats to be supplied with information as to the catch which the herring vessels have on board. In our turn we give this information to the herring companies. Now it happens on occasions that the "Zieten" telegraphs to us "We cannot find the herring fishers. Where are they?" In order to be able to render lasting and appropriate assistance in such a case, we have arranged with the Commander of the "Zieten" to divide the North Sea up into five areas. Furthermore, we have asked the herring companies to notify us on all occasions to what areas the vessels are intending to sail, and upon the receipt of such information we at once communicate with the Commander of the "Zieten": "According to the herring companies, such and such a number of vessels are going to operate in such and such an area." The protection ships promptly steam to where they expect to find the greatest number of vessels fishing.

At the present time we have also made an attempt to get further information regarding the herring fisheries from the herring companies. We have asked them to give us voluntarily on the return on which the voyages are noted, if they come to port, information as to where they have been and whither they intend to go again, the last to be entered on the back of the form; furthermore how many "kantjes" they have brought to land, and what was the locality in which they fished. In this way we are able to amass information regarding these several zones.

II. *International sea investigation.*

[Dr. Henking gave a short account of the statistical work of the International Council for the investigation of the sea.]

III. *Baltic statistics.*

I must now say a word or two regarding the Baltic. I can state briefly that the statistical exertions of the German Sea Fisheries Society have not been of nearly such a comprehensive nature here as they have been hitherto in the case of the North Sea. The reason is that there have been none of those marked inducements which have existed in the case of the North Sea owing to the International Council for Sea Investigation. Here, therefore, the case is different. There are distinct possibilities in the case of the Baltic for an

excellent system of statistics. First of all, under the direction of Herr Geheimrat Wilhelms, catch-books are employed for the so-called high-sea cutters, in which the catches are entered day by day, as well as particulars of the catching-gear employed, and so forth. Then we have also gone so far as to carry out fish measurings in the Baltic on a large scale, not only so as to acquaint ourselves with the catches of different kinds of fishing gear, but also with the peculiarities of fishes, just as I have described to you in the case of the North Sea. At the present moment these measurements are carried out at 22 stations along the Baltic coast, with a view to the condition of the flat fish fisheries being ascertained. We are ascertaining the condition of stake net fishing and of sea fishing because complaints have reached us from every side, especially with regard to the Sea Fisheries. Thanks to the facilities afforded us by the authorities and our friends and co-operators in the several places, we have been able to erect these observation stations all along the Baltic. In Schleswig-Holstein there are eight of them, in Lübeck-Travemünde one, in Mecklenburg five at different places, while they are to be found also along the Prussian Coast as far as Memel.

In addition, I may mention that we have accurate returns of salmon and sea trout and hope to possess ourselves of a large amount of material.

IV. *Statistical co-operation.*

I must confine myself to these remarks upon the Baltic and conclude with the question:—How far can the combination of the returns at present existing be effected and to what extent is such a course desirable?

On this question I must call your attention to a few points. As I have already stated, in Prussia a system of exhaustive fishery statistics is prosecuted by the “head fish masters.” These “head fish masters” with their other fishery officials are in a position to carry out this work, because of their being in constant touch with the fishermen. As a result therefore we obtain really trustworthy information. But if we take, for example, the material afforded by the “head fish masters” and compare it with the returns in special cases, of the Imperial Statistical Office, considerable differences are apparent. For instance, as far as salmon and sea trout are concerned, I have added up the records of the “head fish masters” for the years 1906-07. The comparison is not possible without some further information, because the returns of the fish masters extend from April to April, while those of the Statistical Office run from January to January. For 1906-07 we find that 168,000 m. is recorded as the value of salmon and sea trout from the provinces from East Prussia to Pomerania; the provinces of Schleswig-Holstein, the Mecklenburg coast, and Lübeck are missing. In spite of this, we have already for this half of the Baltic, according to the reports of the head fish masters, 168,000 m. as the value, while the government statistics for the same period do not show 100,000 m. as the value for the whole coast. The following year, 1907-08, shows a value of approximately 200,000 m. for the same period,

according to the returns of fish masters. The Imperial Statistical Office gives the value of salmon and sea trout for the whole of the Baltic from April 1, 1907 to 1908, as 137,000 m.

The differences are therefore very considerable, and demand that the results should be in better agreement. If the matter were submitted to an unbiased judge, he would have his doubts, and would not know how the differences could be reconciled. I think, therefore, it would be desirable that a combination of statistics should take place in order that such discrepancies should be done away with.

Furthermore the results of the fishery statistics of the North Sea, as issued by the Imperial Statistical Office, and the final figures which are arrived at by the German Sea Fisheries Society in its system of statistics above described, show a sequence of divergencies which in my opinion ought not to exist.

It is specially desirable for the German Sea Fisheries Society that the matter should be cleared up one way or the other; the more so, seeing that, as I have already explained, they are in an unfortunate position, because they obtain their statistical returns without payment. It is any time possible for those on the coast, who co-operate out of courtesy, to withhold their returns, or at any rate to furnish them in an incomplete state.

We have to exercise great care in attaining to a completeness of which, in my estimation, we can be proud, and in proving by every possible means of checking whether our returns are complete.

It would greatly facilitate our work if some government office like the Imperial Statistical Office could lend us their support and assistance, so that in this manner the material could be obtained which we collect for international objects and regard as essential to a true representation of fishery statistics. Furthermore, the work which the Imperial Statistical Office now does for us by a process of wider expansion, can suffice perhaps as far as trade statistics go, but it does not help us in our observations on, and determination of, the conditions of the sea fisheries. It is perfectly natural that there should be a department which should busy itself entirely with the sea fisheries question, as in the case of, for instance, the fisheries officials and the English sea fisheries officials—not to mention the German Sea Fisheries Society—a department adapted for testing the material ever passing through its hands so as to see how far it is accurate and can be applied in the interests of the fisheries, and at the same time to take note of the continual changes going on in the industry and to modify the needs altered thereby. I think that above all the English system—the co-operation of the statistical and the fishery officials—to a large extent works out more accurately than the system in existence with us; this is due, I think, to the fact that the two departments work hand in hand. A sketch has already been given of how this could be done (in our own country). I was recently at the International Conference in London, and went to both these offices, where Mr. Rew (Assistant Secretary) has charge

of the department dealing with statistics, and Mr. Archer (Assistant Secretary), the present President of the International Council for Sea Investigation, is in charge of the Fisheries Department. Both these gentlemen when I was over there were the essence of amiability. I was enabled to see everything in working, and only lack of time prevented my seeing all the details.

I consider that it would be very useful for us if the experiment were tried of getting to know exactly the way in which the raw material is collected in England and Scotland and is then turned to account, not only from the trade, but also from the scientific point of view. Such a course would certainly be most instructive for all the departments now concerned with the question of fishery statistics, and would lighten their labours.

V. Value of fishery statistics.

I should now like to say a few words about the object and value of a system of fishery statistics such as is prosecuted by the German Sea Fisheries Society, since on an earlier occasion these questions were raised by the Minister of the Interior. Such a system, unlike that of the trade, has special questions of the sea fisheries in view—namely, the different catching areas of the sea fisheries, whose value in relation to the sea fisheries and the possible variations in whose value can be only correctly estimated if we can obtain the catch results on the several fishing grounds. In this way we also learn whether known species suffer any modifications in their numbers. But since variations occur in the amount of the catch of fish species in the different seasons of the year and in different years, the statistics must not only be accurate, but they must be collected for a long sequence of years. The returns regarding the quantities of the catch must also be referred to a comparable unit of time, say, a voyage-day with similar catching-gear, for it is obvious that the length and number of the fishing voyages should vary the amount of the catch. The consideration of the catching gear and vessel is just as important. Furthermore, there is the accurate discrimination between species of fish, and this is not always such an easy matter. I would first warn persons against the differences between salmon and sea trout in the Baltic area, and of the many complaints and difficulties which present themselves, because, statistically speaking, the difference between the two is not recorded. The value of the fish, again, is determined to a large extent by the size of the fish; consequently, trade categories must be taken into account. Even trade categories vary. It is for this reason that, by an extensive process of measurements at the market itself, one obtains a valuable picture of these trade categories and of the yield of the particular fish in question. Lastly, such experiments are absolutely essential for the consideration of protective measures.

Having regard to the fact that we obtain the original returns of the individual voyages, which are tested by examples on the coast and that we ourselves carry out a series of accurate tests and adopt methods that have been described in the foregoing pages, we attain to a certainty which, I think, can be regarded as satisfactory. Our

statistics are internationally recognised. Their value, moreover, is so great, that all the Northern European States have adopted the same methods, as I have already described to you. Their value is testified to by the representatives of the Northern European States, in reference to which I must call your attention to the resolutions⁷ of the central council at Copenhagen of 1908, which run as follows :—

The central council recommends “that the participating nations should make increased monetary provision for utilising the material brought in by commercial fishing vessels from known fishing grounds at the termination of each trip, as it is only by these means that investigations can be conducted on a sufficiently large basis to afford trustworthy results as to the increase and decrease of fish, the distribution of different species and the distribution of the same species according to number, size, age, and other conditions.”

Thus it is here expressly recommended that greater monetary provision should be made for such statistical objects. In this recommendation, moreover, it is acknowledged that the system of statistics already described is appropriate, and in this way is to be regarded as the correct one. The value of the system is thereby acknowledged.

II.—*The Recent Movement of Population in Japan.* By IWASABURO TAKANO, Professor of Statistics in the Imperial University, Tokio.

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Introductory.

THE statistics relating to the movement of population in our country have been complete since the year 1899, when the system of centralisation in the collection and elaboration of the materials was introduced. Since that year the local registration officials have been required to fill up the so-called “statistical card” for each marriage, divorce, birth, or death, according to the statements made by the persons concerned and certain documentary

⁷ Procès Verbaux of the Réunions of the Council. Special Committees and Sections. (Vol. xi, *Rapports et Procès Verbaux des Réunions.*) Copenhagen, 1908, p. 53.

evidence, these cards being provided beforehand by the Statistical Bureau of the Cabinet. The cards when filled in are sent every three months to the Statistical Bureau, where they are arranged and properly treated for the preparation of the several statistics, which are then summarised in the volume entitled "The Statistics of the Movement of Population in the Japanese Empire." This work was published for the first time in 1902, opening a new era in Japanese statistics, and since then has been issued every year without a break. Before that time we had only very scanty materials for the study of vital statistics in Japan. Now we have good statistical data as to the movement of population, but the publications in question have not yet been issued for many years; and though they contain many detailed statistics, yet they entitle us to wish for more, and at present we must satisfy ourselves with rather commonplace inquiries. I have undertaken such inquiries on the basis mainly, though not entirely, of these new materials, and the outlines of the results are described in the following sections:—

I. *Marriages.*

1. *Number of marriages.*—The number of marriages in each year since 1886 is as follows:—

TABLE 1.—*Marriages of the legal population.*

	Numbers.	Ratio of marriages per thousand inhabitants.		Numbers.	Ratio of marriages per thousand inhabitants.
1886.....	315,311	8.19	1896	501,777	11.75
'87.....	333,149	8.55	'97	365,207	8.45
'88.....	330,246	8.34	'98	471,298	10.77
'89.....	340,445	8.50	'99	297,428	6.72
'90.....	325,141	8.04	1900	346,590	7.70
'91.....	325,651	8.00	'01	378,637	8.33
'92.....	349,489	8.51	'02	394,378	8.57
'93.....	358,389	8.66	'03	371,187	7.94
'94.....	361,319	8.64	'04	399,218	8.46
'95.....	365,633	8.65	'05	351,260	7.37

We see from the table that the number of marriages has almost always been between three hundred thousand and four hundred thousand per annum, but there has been a natural tendency for the numbers to increase in consequence of the increase of population. The regular course of the figures has, however, been broken since 1896, both that year and 1898 exhibiting extraordinary increases and 1899 a sudden decrease; a more steady movement has been resumed since 1901, but the year 1905 again shows a marked decrease. Our marriage-rate, which stands usually above 8 marriages per thousand inhabitants per annum, is higher than that in most European countries. It rose to more than 10 per thousand in 1896 and 1898, and then descended to 6.72 per thousand in 1899, the ordinary rate being recovered in 1901; in 1905 we find again a decrease to 7.37 per thousand. These fluctuations may be easily explained by

the well-known fact that, while the annual number of marriages is fairly steady in ordinary times, when any sudden changes occur in political, judicial, economical or other social conditions, it is liable to be largely affected by them. The regularity of the figures in most years since 1886 is certainly due to the general tranquillity of society maintained during the time. It seems curious that the Chino-Japanese War during 1894-1895 had apparently no influence upon the figures of the said years, but such a phenomenon is not peculiar to Japan, the same thing having been observed in other countries; indeed, the marriage-rate is often not only little influenced during war but generally increases very much after war is over. The sudden increase of marriage in 1896 is almost certainly the after-effect of the war. For the increase in 1898 I cannot, however, assign any adequate reasons. The figures of 1899 show a noticeable decrease, and this is very probably attributable to the enforcement of the Civil Code and the Personal Registration Law, which contained many complicated regulations relating to marriage and was put in force in July, 1898. The somewhat considerable decrease in 1905 may probably be ascribed to the great Russo-Japanese War: war seems to have had on this occasion some influence upon marriage. Japan, after the Chino-Japanese War, had, so to speak, its second renaissance, which caused several important changes and alterations in political, judicial, economical and social affairs; naturally, the number of marriages was much affected by them and showed the sudden movements to which we have referred.

We may add here the quinquennial averages of the number of marriages and the marriage rate to show the general movement:—

	Annual average number of marriages.	Ratio of marriages per thousand of the population.		Annual average number of marriages.	Ratio of marriages per thousand of the population.
1886-90....	328,858	8·32	1896-1900....	396,460	9·10
'91-95....	352,096	8·51	1901- '05....	378,936	8·19

The following figures may also be given as relating to the marriages during 1899-1905—not of the legal population, as above stated, but of the actual population to which our new statistics on the movement of the population refer. There exists, therefore, a slight difference between the numbers of the table and those of Table 1:—

TABLE 2.—*Number of marriages of the actual population.*

1899.....	297,372	1902.....	394,165	1904.....	398,930
1900.....	346,528	'03.....	370,961	'05.....	350,898
'01.....	378,457				

2. *Marriages in different months.*—The following table shows that considerable differences exist between the numbers of marriages in different months of the year:—

TABLE 3.—*Number of marriages in each month of the year.*

Month.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
January	21,367	25,527	32,486	34,736	29,401	31,608	31,206
February	23,823	30,640	31,520	36,423	38,372	44,079	33,858
March	35,650	38,671	41,601	46,434	44,571	55,072	44,456
April	30,330	34,838	39,983	40,384	38,390	43,546	34,369
May	27,664	31,957	36,109	36,833	32,871	33,133	42,648
June	18,051	20,476	22,491	22,945	23,270	21,681	20,910
July	20,693	25,338	27,055	26,890	26,053	22,900	20,045
August	20,751	24,081	24,447	24,549	23,465	23,914	22,321
September ..	23,064	29,016	29,720	31,225	25,058	29,268	25,130
October	23,828	27,353	31,529	30,581	30,305	30,071	23,701
November ..	21,105	24,593	25,257	26,492	24,833	26,530	20,633
December ..	31,046	33,768	36,259	36,673	34,372	37,128	31,621
Total ...	297,372	346,528	378,457	394,165	370,961	398,930	350,898

These fluctuations exhibit certain common characters in every year. To make these clear, if we take, for example, the two years 1901 and 1904, and reckon the average number of marriages per day in every month respectively, we learn, as may be seen in the table given below, that March comes first in number, followed by February, April, May and December. The numbers in the other months are almost all under the average in a year, especially the summer season of June, July, and August, the deficiency in June being the most remarkable. If we compare further the average number per day of a year, taken as 100, with the average per day in each month, we see, *e.g.*, that the month of March in 1901 shows an excess of 29·4 per cent., which is the highest above the average of the year, while June shows a deficiency of 27·7 per cent. In 1904 March shows an excess of 62·9 per cent., and June a deficiency of 33·7 per cent.

TABLE 4.

Month.	1901.		1904.	
	Average of marriages per day.	Ratio of the average of marriages per day in each month to the average of marriages per day in a year taken as 100.	Average of marriages per day.	Ratio of the average of marriages per day in each month to the average of marriages per day in a year taken as 100.
January	1,048	101·0	1,020	93·5
February....	1,126	108·5	1,520	139·4
March	1,342	129·4	1,776	162·9
April	1,333	128·5	1,452	133·1
May	1,165	112·3	1,069	98·0
June	750	72·3	723	66·3
July	873	84·2	739	67·7
August	789	76·0	771	70·7
September ...	991	96·5	976	89·5
October	1,017	98·0	970	89·0
November	842	81·2	884	81·1
December	1,170	112·7	1,198	109·8
Average of } a year.... }	1,037	100·0	1,090	100·0

The figures of other years show similar results; we always find that the greatest number of marriages occur in March and the fewest in the summer months. It is very interesting to compare the former fact with the figures shown by the Roman Catholic countries of Europe, where the fewest marriages occur in March for religious reasons, while the contrary is the case in our country, the month of March being regarded as a happy one for marriage. These two facts, however, well illustrate the influence of custom upon marriage. The fact of fewest marriages occurring in the summer season is a common phenomenon in many countries, and is not peculiar to Japan.

3. *Marriage and age*.—The statistical data enable us to study the frequency of marriage, (a) in relation to the age of husband or wife alone; (b) in relation to the ages of husband and wife jointly.

(a) (i) *Age of husbands*.—Classifying the number of marriages according to the ages of the husbands, the figures for the years 1899-1905 are as follows, eight age-classes being adopted for convenience:—

TABLE 5.—*Number of marriages classified according to the ages of husbands.*

Age-class.	1899.	1900.	1901.	1902.
Not exceeding 20	24,251	27,041	28,286	26,953
Over 20 and not exceeding 25 ...	110,851	127,845	137,421	141,716
" 25 " 30	84,489	101,343	115,047	124,020
" 30 " 35	38,058	43,055	45,607	46,546
" 35 " 40	16,508	20,135	22,780	23,893
" 40 " 45	10,671	12,193	12,652	12,595
" 45 " 50	6,133	7,334	8,155	8,534
" 50	6,381	7,582	8,509	8,999
Total	297,372	346,528	378,457	394,165

Age-class.	1903.	1904.	1905.
Not exceeding 20	23,952	22,436	22,079
Over 20 and not exceeding 25 ...	129,322	138,181	105,002
" 25 " 30	121,176	134,309	117,918
" 30 " 35	45,504	51,052	49,832
" 35 " 40	22,977	24,972	24,634
" 40 " 45	11,450	11,512	13,165
" 45 " 50	7,930	7,696	8,525
" 50	8,650	8,772	9,743
Total	370,961	398,930	350,898

We see from the table that the age-class "over 20 and not exceeding 25" takes usually (except in 1905) the lead of all in number, and accounts for over 30 per cent. of the annual total of marriages. Next come the classes of "over 25 and not exceeding 30" and "over 30 and not exceeding 35," which, taken together, include generally over 40 per cent. of the annual total. (See Table 6.)

TABLE 6.—*Showing the number of marriages out of 100 marriages in each year in the three principal age-classes.*

Husband's age.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Over 20 and not exceeding 25	37.3	36.9	36.3	35.9	34.9	34.6	29.9
„ 25 „ 30	30	28.4	29.2	30.4	32.7	33.7	33.6
„ 30 „	35	12.8	12.4	12.1	11.8	12.3	14.2

If we further examine the number of marriages in each single year of age we observe that the ages 23—26 are generally the period in which the most marriages take place (see Table 7). It is interesting to note from these figures that the highest number of marriages, which occurred between the ages 23 and 24 in 1899 and 1900, occurred between 24 and 25 in 1901, 1902, 1903 and 1905, and between 25 and 26 in 1904. From Table 6 we see that the percentage of marriages in the age-class 20—25 decreased from 37.3 per cent. in 1899 to 29.9 per cent. in 1905, while the proportion in the age class 25—30 rose from 28.4 per cent. to 33.6 per cent. Further, as is pointed out below, there has been a marked decrease in marriages of males under 20. Taking these points into consideration, we may perhaps conclude that the age of husbands at marriage is steadily increasing.

TABLE 7.—*Number of marriages classified according to the age of the husband, by single years.*

Husband's age.	1899.	1900.	1901.	1902.
Over 20 and not exceeding 21....	16,624	17,406	18,650	18,886
„ 21 „ 22....	20,090	23,018	23,616	24,636
„ 22 „ 23 ..	23,238	26,149	28,694	28,337
„ 23 „ 24....	26,104	30,831	32,377	34,666
„ 24 „ 25....	24,795	30,441	34,084	35,190
„ 25 „ 26....	23,455	27,501	31,326	33,787
„ 26 „ 27....	20,029	24,349	26,779	29,442

Husband's age.	1903.	1904.	1905.
Over 20 and not exceeding 21....	16,977	18,594	15,670
„ 21 „ 22....	21,966	24,048	15,220
„ 22 „ 23....	26,405	27,851	20,412
„ 23 „ 24....	30,327	33,532	25,561
„ 24 „ 25....	33,647	34,156	28,139
„ 25 „ 26....	31,968	35,326	27,130
„ 26 „ 27....	29,174	31,476	26,500

(a) (ii) *Age of wife.*—The following table shows the number of marriages in the same years, classified according to the ages of the wives:—

TABLE 8.—*Number of marriages classified according to the ages of wives.*

Age-class.	1899.	1900.	1901.	1902.
Not exceeding 20	100,854	115,425	122,222	126,149
Over 20 and not exceeding 25...	123,989	144,712	158,588	164,801
" 25 " 30....	42,061	51,093	59,054	62,790
" 30 " 35....	16,198	18,421	19,809	20,704
" 35 " 40....	6,750	8,201	9,212	9,758
" 40 " 45....	3,727	4,234	4,597	4,657
" 45 " 50....	2,060	2,390	2,648	2,834
" 50	1,733	2,052	2,337	2,472
Total	297,372	346,528	378,457	394,165

Age-class.	1903.	1904.	1905.
Not exceeding 20	114,436	118,139	95,278
Over 20 and not exceeding 25...	155,942	166,765	143,245
" 25 " 30....	61,297	69,480	65,732
" 30 " 35....	20,450	23,942	24,687
" 35 " 40....	9,550	10,661	10,750
" 40 " 45....	4,114	4,570	5,324
" 45 " 50....	2,727	2,743	3,028
" 50	2,445	2,630	2,854
Total	370,961	398,930	350,898

As is shown by the table, more marriages occur in the age-class "over 20 and not exceeding 25" than in any other, a little over 40 per cent. of the total number of marriages in each year falling between these ages (Table 9). Next to this comes the age-class of "not exceeding 20," some 30 per cent. of the women married in each year being under this age. The age-class "25—30," the third in order of importance, includes only 14·1 per cent. to 18·7 per cent. of the wives. (See Table 9.)

TABLE 9.—*Out of 100 marriages in each year.*

Age-class.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Not exceeding 20	33·9	33·3	32·3	32·0	30·8	29·6	27·2
Over 20 and not exceeding 25	41·7	41·8	41·9	41·8	42·0	41·8	40·8
" 25 " 30	14·1	14·7	15·6	15·9	16·5	17·4	18·7

Considering the marriages at each year of age separately, most marriages occur between the ages 19 and 21. The age 20—21 is almost always predominant, with the exception only of the year 1900, when marriages of women aged 19—20 predominated. (See Table 10.) Seeing that the proportion of marriages of females under 20 years of age decreased from 33·9 per cent. in 1899 to 27·2 per cent. in 1905, we would seem at first sight to be justified in concluding that their age at marriage is rising, as in the case of men. But considering, on the other hand, that the proportion of marriages between the ages 20—25 is almost stationary (a little above 40 per cent. generally), and that most marriages continue to

occur at the age of 20—21, it would rather appear that while the premature marriage of women is indeed decreasing steadily, at the same time there is no marked tendency of the average age at marriage of women over 20 to increase.

TABLE 10.—*Number of marriages classified according to the ages of wives, by single years.*

Age.		1899.	1900.	1901.	1902.
Not exceeding 15		784	875	929	677
Over 15 and not exceeding 16....		7,833	9,245	9,428	9,928
" 16 " 17....		13,783	15,388	15,898	16,014
" 17 " 18....		21,533	23,395	25,354	25,749
" 18 " 19....		26,898	30,623	32,366	34,253
" 19 " 20....		30,023	35,899	38,247	39,528
" 20 " 21....		32,542	35,681	40,087	42,094
" 21 " 22....		29,019	34,459	36,138	38,664
" 22 " 23 ..		25,343	29,472	32,962	32,701
" 23 " 24....		20,906	24,911	27,193	28,646
" 24 " 25....		16,179	20,189	22,209	22,696

Age.		1903.	1904.	1905.
Not exceeding 15		413	334	288
Over 15 and not exceeding 16....		7,983	8,697	6,864
" 16 " 17....		15,361	14,347	11,884
" 17 " 18....		23,179	25,342	18,788
" 18 " 19....		30,702	31,649	27,099
" 19 " 20 ..		36,798	37,770	30,355
" 20 " 21....		39,398	41,225	34,020
" 21 " 22....		36,038	38,476	32,547
" 22 " 23....		32,300	34,360	29,371
" 23 " 24....		25,878	29,243	25,670
" 24 " 25....		22,328	23,461	21,637

(a) (iii) *Premature Marriages.*—Under present conditions in Japan marriage before 20 years of age in the case of the man and 17 years of age in the case of the woman may be properly said to be premature. Taking these ages as the standards, when we look first at the figures for males given below, we observe a by no means insignificant proportion of premature marriages. At the same time, the figures show that the proportion is gradually decreasing.

Marriages of males under 20 years of age.

	Numbers.	Ratio to 100 marriages.		Numbers.	Ratio to 100 marriages.
1899	24,251	8.0	1903	23,952	6.5
1900	27,041	7.8	'04	22,436	5.6
'01	28,286	7.5	'05	22,079	6.3
'02 ...	26,953	6.8			

Marriages of women under the age of 17 are also not few in number, though in this case also there is a declining tendency, as seen from the following figures:—

Marriages of females under 17 years of age.

	Numbers.	Ratio to 100 marriages.		Numbers.	Ratio to 100 marriages.
1899	22,400	7.5	1903	23,757	6.4
1900	25,508	7.4	'04	23,378	5.9
'01	26,255	6.9	'05	19,036	5.4
'02	26,619	6.8			

(a) (iv) *Late Marriages*.—If we regard the marriages after the age of 35 in the case of the man and 30 in the case of the woman as “late,” the ratios of “late marriages” per hundred of all marriages are as follows. We see that the ratio remained almost constant for both sexes in these years, except in 1905, which shows an exceptional increase :—

	Proportion of marriages of males above age 35 per 100 marriages.	Proportion of marriages of females above age 30 per 100 marriages.		Proportion of marriages of males above age 35 per 100 marriages.	Proportion of marriages of females above age 30 per 100 marriages.
1899 ...	13.5	10.3	1903....	13.6	10.7
1900....	13.7	10.2	'04....	13.3	11.2
'01....	13.7	10.2	'05....	16.0	13.3
'02....	14.0	10.3			

As regards these late marriages, we ought to examine whether the parties are married for the first time or not, and take only those married for the first time into consideration, but the necessary data are not available.

(b) *Ages of husband and wife in combination*.—As the figures during each of the seven years since 1899 are on the whole similar in this respect, I have confined myself simply to the analysis and explanation of the figures for 1904.

The number of marriages in 1904 classified by the ages of husband and wife in combination is as follows :—

TABLE 11.—*Number of marriages in 1904 classified according to the combination of the ages of husband and wife.*

Age of wife.	Age of husband.								Total.
	Under 20.	20—25.	25—30.	30—35.	35—40.	40—50.	50—60.	60—	
Under 15	72	199	53	8	2	—	—	—	334
15—20....	15,829	63,368	32,204	5,182	954	240	24	4	117,805
20—25....	5,990	63,541	69,438	19,990	5,771	1,835	179	21	166,765
25—30....	481	9,750	27,236	17,597	8,989	4,772	604	51	69,480
30—35....	55	1,063	4,396	6,359	5,825	5,064	1,070	110	23,942
35—40....	9	222	806	1,515	2,545	3,900	1,491	173	10,661
40—50....	—	33	170	376	816	2,963	2,356	599	7,313
50—60....	—	5	5	25	65	410	1,004	712	2,226
60—	—	—	1	—	5	24	99	275	404
Total	22,436	136,181	134,309	51,052	24,972	19,208	6,827	1,945	398,930

It will be seen that marriages occur most frequently between a man aged 25—30 and a woman of 20—25, and next most frequently between a man of 20—25 and a woman of 20—25 or 15—20. Altogether these three age combinations include nearly half the marriages.

From the above figures I have made the two tables given below (Tables 12 and 13), which show the percentage of husbands of each age-class who married wives of a given age, and similar data for the women.

Considering first the distribution of ages of wives for a given age of husband, the following table gives the figures:—

TABLE 12.—*Percentage distribution of the marriage of males in each age-class according to the age of the wife, 1904.*

[illegible]

On the whole we see that, as in European countries, the man is likely to select a woman of an age slightly below, but not very different from his.

Next, considering the ages of husbands for wives of a given age, we have the table :—

TABLE 13.—*Percentage distribution of the marriage of females in each age-class according to the age of the husband, to each total taken as 100 (1904).*

[illegible]

Generally speaking, as in European countries, a woman is inclined to be married to a man of an age slightly above hers.

It may be noted, in conclusion, that marriages between old men and old women seem to be increasing in some degree, as is indicated by the figures below :—

Number of marriages.	1899.	1900.	1901.	1902.	1903.	1904.
Man above the age of 50 with woman above the age of 50 }	1,343	1,595	1,822	1,913	1,912	2,090

4. *Marriage and civil condition.*—We will now proceed to the study of the influence of the civil condition of the parties concerned upon the number of marriages.

(a) *Civil condition of husbands and wives considered separately.*—First, let us classify the number of marriages according to the civil condition of the husband at the time of his marriage. The following tables show the absolute numbers and also the percentages of bachelors, widowers, and the divorced :—

TABLE 14.—(i) *Number of marriages classified according to the civil condition of the husband.*

Civil condition.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Bachelors	234,075	278,384	302,613	318,375	300,993	326,905	280,439
Widowers	23,096	26,655	28,825	29,534	28,985	28,327	28,465
Divorced....	37,549	39,743	42,216	40,552	36,413	36,485	33,715
Unknown	2,652	1,746	4,803	5,604	4,570	7,213	8,279
Total....	297,372	346,528	378,457	394,165	370,961	398,930	350,898

(ii) *Percentage of marriages classified according to the civil condition of the husband.*

Civil condition.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Bachelors	78·7	80·3	79·9	80·8	81·1	81·9	79·9
Widowers	7·8	7·7	7·6	7·5	7·8	7·1	8·1
Divorced....	12·6	11·5	11·2	10·3	9·8	9·1	9·6
Unknown	0·9	0·5	1·3	1·4	1·3	1·9	2·4
	100·0	100·0	100·0	100·0	100·0	100·0	100·0

We see that the bachelors are in the majority, and form about 80 per cent. of the men married each year. Next come the divorced, and lastly the widowers.

Secondly, classifying the number of marriages by the civil condition of the wife at the time of her marriage, the following

tables show the absolute numbers and also the percentages of spinsters, widows, and the divorced:—

TABLE 15.—(i) *Number of marriages classified according to the civil condition of the wife.*

Civil condition.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Spinsters	247,093	294,606	313,951	328,430	317,916	320,019	272,379
Widows	8,593	9,271	10,570	10,913	10,031	9,495	8,710
Divorced	33,486	36,549	38,737	36,932	35,453	32,091	28,534
Unknown	8,200	6,102	15,199	17,890	7,561	37,325	41,275
Total	297,372	346,528	378,457	394,165	370,961	398,930	350,898

(ii) *Percentage of marriages classified according to the civil condition of the wife.*

Civil condition.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Spinsters	83.1	85.0	83.0	83.3	85.7	80.2	77.6
Widows ...	2.9	2.7	2.8	2.8	2.7	2.4	2.5
Divorced	11.3	10.5	10.2	9.4	9.6	8.0	8.1
Unknown	2.7	2.8	4.0	4.5	2.0	9.4	11.8
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In this case spinsters are in the majority, the divorced are second, and the widows third.

That marriages between bachelors and spinsters form the great majority of all marriages is a general fact, not peculiar to our country. But, in Europe, marriages between widowers and widows come next in number, while with us the divorced come second. This is clearly due to the larger number of divorces in Japan and the consequently greater number of the divorced in proportion to the population. These marriages, however, are tending to decrease, that is, on the husband's side the ratio per 100 marriages declined from 12.6 per cent. in 1899 to 9.6 per cent. in 1905, and on the wife's side from 11.3 per cent. to 8.1 per cent., a fact which indicates also the recent improvement in the proportion of divorces.

Moreover, our attention is attracted in the figures of Tables 14 and 15 by the fact that the number of marriages of divorcees and of widows is less than that of divorced men and of widowers. This may in part be due to the fact that re-marriage is more difficult for the woman than for the man.

(b) *Marriages classified according to the civil conditions of husbands and wives in combination.*—I have taken here as an example the figures of 1903:—

TABLE 16.—*Number of marriages in 1903 classified according to the combination of the civil conditions of husbands and wives.*

Wife.	Husband.				
	Bachelor.	Widower.	Divorced.	Unknown.	Total.
Spinster.....	276,344	16,211	22,427	2,934	317,916
Widow	5,101	3,017	1,599	314	10,031
Divorced	14,830	8,592	11,306	725	35,453
Unknown	4,718	1,165	1,081	597	7,561
Total	300,993	28,985	36,413	4,570	370,961

If we regard the figures first from the side of the husband, we learn that bachelors have nearly all married spinsters (91·8 per cent.), and the majority of the re-married, that is, of divorced men and widowers, also married spinsters (see the figures below).

Wife.	Husband.			
	Bachelor.	Widower.	Divorced.	Unknown.
Spinster.....	91·8	55·9	61·6	64·2
Widow	1·7	10·4	4·4	6·9
Divorced	4·8	29·6	31·0	15·9
Unknown	1·7	4·1	3·0	13·1
	100·0	100·0	100·0	100·0

Next, regarding the figures from the side of the wife, we see that spinsters have mostly married bachelors, but the proportion of spinsters marrying bachelors is less than that of bachelors marrying spinsters. Most of the females who re-married also married bachelors, but the proportions are again smaller than the corresponding rates for males (see the table below). Thus we can say the chance of a man, no matter whether a bachelor or previously married, marrying a spinster is always greater than the corresponding chance of a spinster marrying a bachelor.

Husband.	Wife.			
	Spinster.	Widow.	Divorced.	Unknown.
Bachelor	86·9	50·9	41·8	62·4
Widower	5·1	30·1	24·2	15·4
Divorced ...	7·1	15·9	31·9	14·3
Unknown	0·9	3·1	2·1	7·9
	100·0	100·0	100·0	100·0

II. *Divorce.*

1. *Number of divorces.*—The numbers of divorces and the proportions to population from 1886 to 1905 are as follows:—

TABLE 17.—*Number of divorces of the legal population.*

	Number of divorces.	Ratio per 1,000 inhabitants.		Number of divorces.	Ratio per 1,000 inhabitants.
1886 ...	117,964	3·06	1896	115,654	2·71
'87	110,859	2·84	'97	124,075	2·87
'88	109,175	2·76	'98	99,465	2·27
'89	107,478	2·68	'99	66,626	1·51
'90	109,088	2·70	1900	63,926	1·42
'91	112,411	2·76	'01	63,593	1·41
'92	113,498	2·76	'02	64,311	1·40
'93	116,775	2·82	'03	65,571	1·40
'94	114,436	2·74	'04	64,016	1·36
'95	110,538	2·62	'05	60,179	1·26

We see that the number of divorces always exceeded 100,000, and the proportion to the population 2·7 per thousand, until the year 1898, while in 1899 it sank suddenly to 60,000 odd with the rate of 1·5 per thousand. In a word, the year 1898 marks a boundary line between the two periods. This great change can be undoubtedly attributed to the enforcement of the new Civil Code and the Personal Registration Law on July, 1898, which also caused a sudden temporary decrease in the number of marriages as mentioned above—a very good example of the influence of law upon social phenomena.

After this change the annual figures show no great fluctuations, though they decreased markedly in 1905, probably in consequence of the Russo-Japanese war. Thus we can recognise that the number of divorces presents no great variations year by year in a time of tranquillity, but it may exhibit great changes under exceptional circumstances as in time of war or when alterations in the law are made.

The significant improvement in regard to divorce is very clearly indicated by the following summary figures:—

	Average number of divorces per annum.	Ratio per 1,000 inhabitants.	Ratio per 1,000 marriages in the same year.
1886-98	112,440	2·73	308·2
'99-1905	64,032	1·39	176·6

That is, in the period before 1898 the number of divorces was 112,440 per annum with the ratio to the population 2·73 per thousand, and the ratio to marriages 308·2 per thousand (a little less than one-third of the total marriages), while after 1899 the absolute number sank to a little below the half, *i.e.*, 64,032 per

annum, and the ratio to the population to 1·39 per thousand and that to the marriages to 176·6 per thousand (about one-sixth of the total marriages). In spite of this our divorce rate stands very high above that of other civilised countries. Among the latter, the United States of America with the divorce rate of 82 per thousand marriages in 1897-1906, and Switzerland with 42 per thousand marriages in the same period occupy the foremost rank, while France has 31 per thousand in the period 1897-1905, Germany 20 per thousand in 1897-1906, and Great Britain even so low a rate as 2 per thousand in 1897-1906. Even with the improved rate of 176·6 per thousand, ours is exceptionally high.

We may also give a divorce rate based on the number of existing couples in the years 1888, 1893, 1898 and 1903:—

TABLE 18.

	Number of married couples.	Number of divorces.	Ratio of divorces per 10,000 couples.
1888.....	7,419,953	109,175	147·1
'93.....	7,612,764	116,775	153·4
'98.....	7,979,858	99,465	124·6
1903.....	8,229,152	65,571	79·7

We see that the divorce rate per 10,000 couples decreased from 147·1 in 1888 to 124·4 in 1898, and then to the very much lower rate of 79·9 in 1903.

2. *Divorce and season.*—The number of divorces in each month of the year is as follows:—

TABLE 19.—*Number of divorces in each month of a year.*

Month.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
January	6,038	5,520	5,619	5,670	5,409	5,582	5,254
February ..	5,662	5,310	5,249	5,105	5,668	6,290	5,127
March	7,360	6,913	5,994	6,541	6,880	6,759	6,494
April	5,878	5,906	6,018	5,764	6,012	6,660	5,410
May	5,559	5,363	5,542	5,462	5,469	5,439	5,492
June	3,678	3,413	3,680	3,699	4,008	3,743	3,211
July	4,696	4,499	4,668	4,470	4,824	4,068	3,723
August	5,243	5,065	4,633	4,685	5,001	4,342	4,577
September	5,821	5,984	5,843	6,052	5,208	5,452	5,450
October ...	5,702	5,575	5,773	5,804	6,177	5,443	5,164
November	4,619	4,581	4,617	4,737	4,723	4,463	4,182
December	6,289	5,699	5,806	6,150	5,995	5,672	5,977

To find out the common points in these fluctuations, let us take the figures of the two years 1899 and 1905. As will be seen from the table given below, the average number of divorces per day in both these years is highest in March and lowest in June, July and November being next lowest. The figure for March is nearly 30 per cent. above the average of the year, and that for June over 30 per cent. below.

TABLE 20.

Month.	1899.		1905.	
	Average number of divorce per day.	Ratio of the average of divorce per day in each month to the average per day in a year taken as 100.	Average number of divorce per day.	Ratio of the average of divorce per day in each month to the average per day in a year taken as 100.
January	194	106.6	169	103.0
February.....	202	110.9	183	111.3
March	237	130.2	209	127.3
April	196	107.5	180	109.6
May	179	98.4	177	107.7
June	123	67.2	107	65.1
July.....	151	83.1	120	73.0
August	169	92.8	148	89.7
September	194	106.4	182	110.4
October	184	100.9	167	101.2
November ...	154	84.4	139	84.7
December ...	203	111.3	193	117.2
Average of } a year }	182	100.0	165	100.0

In the other five years a similar mode of fluctuation can be traced. But as to the reasons for this fluctuation I am unable to offer any explanation.

3. *Divorce and age*.—We will now proceed to examine the phenomenon of divorce in relation to the ages of the parties concerned, that is, first in relation to the age of husband or wife alone, and secondly in relation to the ages of husband and wife in combination.

(a) *Age of husband or wife alone*.—(i) If we first classify the number of divorces by the age of husband, the figures in the years 1899-1905 are:—

TABLE 21.—*Number of divorces classified according to the age of husband.*

Age.	1899.	1900.	1901.	1902.
Not exceeding 20	4,405	3,098	2,380	2,205
Over 20 and not exceeding 25....	18,878	17,015	15,189	14,863
" 25 " 30...	17,607	17,896	17,967	18,198
" 30 " 35...	10,832	10,416	10,578	10,715
" 35 " 40...	5,424	5,895	6,610	7,026
" 40 " 50...	6,485	6,360	7,059	7,151
" 50 " 60...	2,206	2,352	2,809	3,000
" 60	706	796	850	981
Unknown	2	—	—	—
Total	66,545	63,828	63,442	64,139

TABLE 21.—*Contd. Number of divorces classified according to age of husband.*

Age.	1903.	1904.	1905.
Not exceeding 20	1,882	1,559	1,486
Over 20 and not exceeding 25 ...	14,342	12,835	11,069
" 25 " 30....	18,763	17,933	17,455
" 30 " 35 ..	11,062	11,235	11,097
" 35 " 40....	7,437	7,541	6,978
" 40 " 50....	7,565	8,008	7,425
" 50 " 60....	3,255	3,574	3,387
" 60	1,086	1,228	1,164
Unknown	—	—	—
Total	65,392	63,913	60,061

The table tells us that after 1899 the divorce occurred most frequently in the age class 25—30 every year, and next most frequently in the two neighbouring classes, *i.e.*, 20—25 and 30—35, so that these three age classes taken together contribute about 70 per cent. of the total. This is probably due to the fact that the marriage of the man is contracted most frequently between the ages 20—25 and in the following age groups, while the divorce occurs generally within a few years after marriage, as will be shown below.

One thing more we can learn from the table is that while the number of divorces at ages under 25 has tended to decrease gradually since 1899, at the ages above 25 it has tended to increase. Probably this arises chiefly from the changes in the numbers of marriages, which have tended to decrease at the ages under 20 and to increase at the ages above 20.

(ii) If we next classify the number of divorces by the age of wife, the figures are:—

TABLE 22.—*Number of divorces classified according to the age of wives.*

Age.	1899.	1900.	1901.	1902.
Not exceeding 15	437	151	46	14
Over 15 and not exceeding 20....	14,954	12,192	10,208	9,719
" 20 " 25....	23,919	23,003	21,965	21,617
" 25 " 30....	12,605	13,325	14,299	14,972
" 30 " 35....	6,666	6,723	7,029	7,407
" 35 " 40....	3,432	3,558	4,327	4,477
" 40 " 50....	3,452	3,579	4,144	4,292
" 50 " 60....	918	1,094	1,211	1,374
" 60	161	203	213	267
Unknown	1	—	—	—
Total	66,545	63,828	63,442	64,139

TABLE 22—*Contd.* Number of divorces classified according to age of wives.

Age.	1903.	1904.	1905.
Not exceeding 15	17	4	13
Over 15 and not exceeding 20....	9,123	8,089	7,077
" 20 " 25....	21,380	20,002	18,441
" 25 " 30....	15,612	15,421	14,990
" 30 " 35....	7,788	8,106	8,131
" 35 " 40....	5,217	5,280	4,786
" 40 " 50....	4,457	4,870	4,673
" 50 " 60....	1,522	1,798	1,610
" 60	276	343	340
Unknown	—	—	—
Total	65,392	63,913	60,061

On looking at the table, we observe that the majority of divorces always take place in the age-class 20—25, which includes 30 per cent. and more of the total every year; and next comes the class 25—30 (except in the year 1899), which includes 20 per cent. and more of the total. We see, moreover, that divorces under age 25 tend to decrease, while those over the age of 25 tended to increase, at least up to 1904. These changes are probably also due in general to the changes in the number of marriages at the different ages.

(b) *Ages of husband and wife in combination.*—We have now to consider the number of divorces from the point of view of the ages of husband and wife in combination; but, as it takes too much space to give all the figures for the seven years 1899-1905, it will be sufficient to give the figures for 1905 as an illustration:—

TABLE 23.—*Number of divorces classified according to the ages of husbands and wives in combination in 1905.*

Age of wife.	Age of husband.				
	Not exceeding 20.	Over 20 and not exceeding 25.	Over 25 and not exceeding 30.	Over 30 and not exceeding 35.	Over 35 and not exceeding 40.
Not exceeding 15	4	8	—	1	—
Over 15 and not exceeding 20	983	3,692	2,089	328	51
" 20 " 25	453	6,008	8,536	2,681	532
" 25 " 30	42	1,395	5,704	4,948	1,985
" 30 " 35	2	123	992	2,597	2,461
" 35 " 40	1	20	108	437	1,452
" 40 " 50	—	3	26	99	463
" 50 " 60	—	—	—	6	32
" 60	—	—	—	—	2
Total	1,486	11,069	17,455	11,097	6,978

TABLE 23—*Contd.* Number of divorces, husbands and wives, 1905.

Age of wife.	Age of husband.			
	Over 40 and not exceeding 50.	Over 50 and not exceeding 60.	60—	Total.
Not exceeding 15	—	—	—	13
Over 15 and not exceeding 20	13	9	1	7,077
„ 20 „ „ 25	203	26	2	18,441
„ 25 „ „ 30	879	110	17	14,990
„ 30 „ „ 35	1,660	271	25	8,131
„ 35 „ „ 40	2,183	516	69	4,786
„ 40 „ „ 50	2,234	1,532	316	4,673
„ 50 „ „ 60	238	854	480	1,610
„ 60	15	69	254	340
Total	7,425	3,387	1,164	60,061

The ratios of the numbers at each age-combination to the total taken as 1,000 are :—

TABLE 24.—*Ratio of the number of divorces of each age-class combination to the total divorces taken as 1,000 (1905).*

Age of wife.	Age of husband.							
	Not ex- ceeding 20.	20—25.	25—30.	30—35.	35—40.	40—50.	50—60.	60—
Not exceed- ing 15 ... }	0.1	0.1	—	0.0	—	—	—	—
15—20	16.4	60.0	34.8	5.5	0.9	0.2	0.1	0.0
20—25	7.5	100.0	142.2	44.6	8.9	3.4	0.4	0.0
25—30	0.7	21.7	95.0	82.4	33.1	14.6	1.8	0.3
30—35	0.0	2.1	16.5	43.2	41.0	27.6	4.5	0.4
35—40	0.0	0.3	1.8	7.3	24.2	36.4	8.6	1.2
40—50	—	0.1	0.4	1.6	7.7	37.2	25.5	5.3
50—60	—	—	—	0.1	0.5	4.0	14.2	8.0
60—	—	—	—	—	0.0	0.3	1.2	4.2

As we have seen, divorce occurs most frequently between the ages 25—30 of the husband and ages 20—25 of the wife, so that as we would expect the most prevalent age-combination of divorce is that between ages 25—30 of the husband and 20—25 of the wife, this group including 142.2 per thousand of all divorces in 1905. Next comes the combination between ages 20—25 of the husband and 20—25 of the wife, this group contributing 100.0 per thousand of all divorces.

4. *Divorce and the duration of marriage.*—The following table shows the relation which exists between divorce and the duration of marriage :—

TABLE 25.—*Number of divorces classified according to the duration of marriage.*

Duration of marriage.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Not exceeding 1 year	14,937	10,181	10,640	11,682	11,730	10,332	9,267
Over 1 and not exceeding 2 years	15,880	12,583	9,784	10,517	11,183	10,874	9,865
Over 2 and not exceeding 3 years	7,577	11,088	8,899	6,759	7,482	7,935	7,455
Over 3 and not exceeding 4 years	7,818	5,459	7,943	6,281	4,936	5,350	5,598
Over 4 and not exceeding 5 years	3,790	6,369	4,301	5,987	4,825	3,768	3,964
Not exceeding 5 years	50,002	45,680	41,567	41,256	40,156	38,259	36,149
Over 5 and not exceeding 10 years	9,074	10,165	12,756	13,089	14,490	14,141	12,865
Over 10 and not exceeding 15 years	3,762	4,116	4,620	4,793	5,161	5,259	5,332
Over 15 and not exceeding 20 years	1,819	1,839	2,037	2,231	2,595	2,791	2,680
Over 20 years	1,700	1,837	2,219	2,513	2,724	3,211	2,790
Unknown	188	191	243	257	266	252	245
Total	66,545	63,828	63,442	64,139	65,392	63,913	60,061

To make the form of the distribution clearer we give also the proportional numbers for the two years 1900 and 1905:—

TABLE 26.—*Ratio of the number of divorces for each duration of marriage to the total number taken as 1,000.*

	1900.	1905.
Not exceeding 1 year	159.5	154.3
Over 1 and not exceeding 2 years	197.1	164.2
„ 2 „ 3 „	173.7	124.1
„ 3 „ 4 „	85.5	93.2
„ 4 „ 5 „	99.8	66.0
Not exceeding 5 years	715.6	601.8
Over 5 and not exceeding 10 years	159.3	214.2
„ 10 „ 15 „	64.5	88.8
„ 15 „ 20 „	28.8	44.6
Over 20 years	28.8	46.5
Unknown	3.0	4.1
	1000.0	1000.0

We observe that the great majority of divorces occur within five years after marriage, forming in 1900 715.6 per thousand, and in 1905 601.8 per thousand of the total; even the first three years after marriage included in 1900 more than half (530.3 per thousand), and in 1905 little less than half the total (442.6 per thousand). But on examining the figures further we learn also that the divorces within five years after marriage tend to decrease, while those after five years of marriage tend to increase.

5. *Divorce by mutual agreement and divorce by judicial procedure.*—The figures relating to divorces by mutual agreement and divorces by judicial procedure are :—

TABLE 27.—*Number of divorces by mutual agreement and divorces by judicial procedure.*

	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Divorce by mutual agreement	66,378	63,632	63,248	63,964	65,198	63,646	59,824
Divorce by judicial procedure—							
(a) Petitions filed by husband }	27	29	28	23	26	26	19
(b) Petitions filed by wife..... }	140	164	166	152	168	241	218
Total	167	193	194	175	194	267	237
Total	66,545	63,828	63,442	64,139	65,392	63,913	60,061

Divorces by mutual agreement form the great majority of all divorces, divorces by judicial procedure forming only some two to four per thousand of the total; of the latter, actions provoked by the wife far exceed in number those provoked by the husband.

Ratio per 1,000 divorces.

	1899.	1900.	1901.	1902.	1903.	1904.	1905.
Divorce by mutual agree- ment	997·5	996·9	996·9	997·3	997·0	995·8	996·1
Divorce by judicial pro- cedure	2·5	3·1	3·1	2·7	3·0	4·2	3·9

III. Births.

1. *Number of births.*—The number of births during the twenty years from 1886 to 1905 is :—

TABLE 28.—*Number of births (a sum total of the living-births of the legal population and the still-births of the actual population).*

	Number of births.	Ratio per 1,000 inhabitants.		Number of births.	Ratio per 1,000 inhabitants.
1886	1,108,967	28·8	1896	1,409,391	33·0
'87	1,119,001	28·6	'97 ...	1,464,362	33·9
'88	1,250,224	31·6	'98	1,495,479	34·2
'89	1,295,161	32·3	'99	1,523,804	34·4
'90	1,237,126	30·6	1900	1,559,906	34·8
'91	1,178,164	28·5	'01	1,658,850	36·5
'92	1,312,586	32·5	'02 ...	1,670,798	36·3
'93	1,287,299	31·1	'03	1,647,467	35·3
'94 ...	1,322,151	31·7	'04	1,591,365	33·7
'95	1,363,642	32·3	'05	1,599,131	33·3

The number of births, we see, during this period has increased progressively from 1,108,967 in 1886 to 1,599,131 in 1905, partly as the natural result of the increase of our population. The ratio per 1,000 inhabitants has increased from 28·8 in 1886 to 33·3 in 1905.

The following quinquennial averages show the increase very clearly:—

	Average number of births per annum.	Ratio of births per 1,000 inhabitants.
1886-90	1,202,096	30·4
'91-95	1,292,768	31·3
'96-1900	1,490,588	34·2
1901-05	1,633,522	35·3

The births rose from the annual average of 1,202,096 during the first five years to 1,633,522 during the last five years, and the corresponding birth-rates from 30·4 per thousand to 35·3 per thousand. It is worthy of attention, as a characteristic phenomenon in Japan, that, in spite of our very high marriage-rate, the birth-rate was until recently relatively low, and while in European countries the birth-rate is falling, especially in recent years, ours has, on the contrary, increased in no small degree, with the exception of the years 1902 to 1905.

Such is the general tendency of the last twenty years, but the annual figures, of course, fluctuate considerably. The years showing a special increase in the birth-rate as compared with that of the previous year are 1888 (31·6 per thousand as compared with 28·6 in 1887) and 1901 (36·5 per thousand as compared with 34·8 per thousand in 1900); but I cannot assign any sufficient reasons for these increases. On the other hand, the years that show remarkable decreases in the birth-rate are: (1) 1890 and 1891 (the rate of 32·3 per cent. in 1889 suddenly fell in 1890 to 30·6 per cent., and again to 28·5 per cent. in 1891); (2) 1904 and 1905 (the rate of 35·3 per cent. in 1903 suddenly decreased in 1904 to 33·7 per cent., and again to 33·3 per cent. in 1905). The average price of rice had been about five yen per one "koku" till 1890, when it rose to the extraordinary height of over eight yen, owing to the bad harvest, and with this rise other commodities showed an upward tendency in price, thereby affecting the number of marriages in no small degree (the marriage-rate decreased from 8·50 per thousand in 1889 to 8·04 per thousand in 1890, and again to 8·00 per thousand in 1891). These changes in food prices may be taken as the reasons for the first fall. The fall in 1904-05 can perhaps be assigned to the influence of the Russo-Japanese war, but the China-Japanese war of 1894-95 did not show any such effect.

In short, the absolute number of our births appears to be tending to increase year by year, with only such disturbances of this usual course as may be accounted for by exceptional circumstances. The birth-rate, which was comparatively low, has increased gradually till of recent years it has reached values from 33 to 36 per thousand of the population.

2. *Living births and still-births.*—When the living-births and still-births are separated, the figures are as follows:—

TABLE 29.—*Number of living-births of the legal population, and number of still-births of the actual population.*

	Number of living-births.	Ratio of living-births per 1,000 of the population.	Number of still-births.
1886	1,050,617	27·3	58,350
'87	1,058,137	27·1	60,865
'88	1,172,729	29·6	77,495
'89	1,209,910	30·2	85,251
'90	1,145,374	28·3	91,752
'91	1,086,775	26·7	91,389
'92	1,207,034	29·4	105,552
'93	1,178,428	28·5	108,871
'94	1,208,983	28·9	113,168
'95	1,246,427	29·5	117,215
'96	1,282,178	30·0	127,213
'97	1,334,125	30·9	130,237
'98	1,369,638	31·3	125,841
'99	1,388,077	31·4	135,727
1900	1,421,919	31·7	137,987
'01	1,503,361	33·1	155,489
'02	1,513,090	32·9	157,708
'03	1,493,547	32·0	153,920
'04	1,444,307	30·6	147,058
'05	1,457,039	30·3	142,092

During this period the living-births always formed over 90 per cent. of the total births, as may be seen from the figures below, and both the numbers of living-births and the ratio per thousand of the population increased to a maximum of 33·1 in 1901.

	Average number of living-births per annum.	Ratio per 1,000 inhabitants.	Ratio per 100 births.
1886-90	1,127,353	28·5	93·8
'91-95	1,189,529	28·8	91·7
'96-1900	1,359,167	31·2	91·2
1901- '05	1,482,269	32·1	90·7

The still-births, however, also increased in the same period both in absolute number, in proportion to the population, and in proportion to the total births. They formed 6·2 per cent. of the total births in the first quinquennium and no less than 9·3 per cent. in the last, as shown below. In Europe the still-

	Average number of still-births per annum.	Ratio per 1,000 inhabitants.	Ratio per 100 births.
1886-90	74,743	1·8	6·2
'91-95	107,239	2·6	8·3
'96-1900	131,401	3·0	8·8
1901- '05	151,253	3·3	9·3

births are usually between 2 per cent. and 5 per cent. of the total births, and so our proportion of the still-born is certainly extraordinary. The increase is perhaps due in some degree to the closer investigation of still-births by the authorities, but at the same time some other causes must certainly have been operating to produce so many still-born, and against these we must take all possible measures.

3. *Births and season.*—The figures of 1901 and 1905 have been taken as examples for the following table instead of all the figures from 1899 to 1905 :—

TABLE 30.—*Number of births in each month of a year.*

Month.	1901.			1905.		
	Living-births.	Still-births.	Total births.	Living-births.	Still-births.	Total births.
January	164,682	15,261	179,943	160,077	14,580	174,657
February	135,168	14,604	149,772	140,697	13,944	154,641
March	159,173	15,435	174,608	161,996	14,071	176,067
April	137,803	12,548	150,351	110,724	11,761	122,485
May.....	114,374	11,498	125,872	103,630	10,630	114,260
June	91,887	10,046	101,933	83,940	9,068	93,008
July.....	103,366	11,321	114,687	99,821	10,698	110,519
August	107,225	11,833	119,058	104,860	10,808	115,668
September ..	119,888	12,277	132,165	114,174	11,066	125,240
October	120,821	12,717	133,538	115,269	11,584	126,853
November ..	120,021	12,984	133,005	116,906	11,421	128,327
December ..	127,183	14,958	142,141	140,676	12,456	153,132
Unknown	—	7	7	—	5	5
Total	1,501,591	155,489	1,657,080	1,452,770	142,092	1,594,862

If we now compare the average number of births per day in each month with the average per day in a year on the scale of 100 we see that the births in January to March both in 1901 and 1905 are much above the average of the year. The same result is obtained when the living-births and still-births are distinguished.

Referring to the figures of years other than 1901 and 1905 similar phenomena are observed. Thus we see that in Japan, as in European countries, births are most in number in the months from January to March—a phenomenon generally acknowledged to be due to natural causes, as the children born in the said months are those conceived in the period from April to June of the previous year, that is, the time between the spring and early summer seasons.

TABLE 31.—*Ratio of the average of births per day in each month to the average of births per day in a year taken as 100.*

Month.	1901.			1905.		
	Ratio of the average of living births per day in each month to the average of living-births per day in a year taken as 100. (a)	Ratio of the average of still-births per day in each month to the average of still-births per day in a year taken as 100. (b)	Ratio of the average of total births per day in each month to the average of total births per day in a year taken as 100. (c)	Ratio of the average of living-births per day in each month to the average of living-births per day in a year taken as 100. (a)	Ratio of the average of still-births per day in each month to the average of still-births per day in a year taken as 100. (b)	Ratio of the average of total births per day in each month to the average of total births per day in a year taken as 100. (c)
January	129	116	128	130	121	129
February....	117	122	118	126	128	126
March	125	117	124	131	117	130
April	112	98	110	93	101	93
May.....	90	87	89	84	88	84
June	74	79	74	70	78	71
July.....	81	86	81	81	89	82
August	84	90	85	85	90	85
September	97	96	97	96	95	96
October	94	96	95	93	96	94
November	97	101	98	98	98	98
December	100	113	101	114	103	113

4. *Births classified by sex.*—When the births are classified by sex it is always observed, as is well known, that the males are in excess. The figures for recent years in Japan show the ratio of 105·4 males to 100 females.

TABLE 32.—*Births classified according to sex.*

Year.	Male.	Female.	Males to 100 females.
1899.....	784,201	738,032	106·3
1900.....	802,173	757,906	105·8
'01.....	850,994	805,670	105·6
'02.....	855,966	812,096	105·4
'03 ..	844,243	799,051	105·7
'04	815,123	771,928	105·6
'05	810,043	784,482	103·3

That the number of male births is more than the number of female is not only the case for the total births, but also for the living-born and the still-born, the legitimate and illegitimate births. But as regards the degree of the excess there are some characteristic differences. Firstly, the excess of male births is especially remarkable with the still-born—a fact common to European countries. Of the total number of births from 1899 to 1905, the excess of male births as compared with 100 female births was 5·4, but for living-births the excess was a little less, viz., 4·9, while for the still-born the excess was as much as 10·3.

TABLE 33.—*Living- and still-births classified by sex.*

Year.	Living-births.			Still-births.		
	Male.	Female.	Males to 100 females.	Male.	Female.	Males to 100 females.
1899....	713,442	673,539	105·9	70,759	64,493	109·7
1900....	729,916	692,618	105·1	72,257	65,288	110·7
'01....	769,494	732,097	105·1	81,500	73,573	110·7
'02....	773,296	737,539	104·9	82,670	74,557	110·9
'03....	763,806	726,010	105·2	80,437	73,041	110·1
'04....	738,230	702,141	105·1	76,893	69,787	110·2
'05....	735,948	716,822	102·7	74,095	67,660	109·5

Secondly, though the number of males exceeds the number of females in the case of the illegitimate births also, the rate of male excess is comparatively small. For instance, as may be seen in the following figures, of the total number of living-births in 1899 the male exceeded the female by 5·9 per cent., but for the illegitimate births the rate of excess is only 5·7 per cent., a little less than the excess for the legitimate births, which is 6 per cent. Again, of the total number of the still-born, the males exceeded the females by 9·7 per cent., but for the illegitimate still-births the excess is only 5·6 per cent., against 10·7 per cent. for the legitimate. The results for other years are similar.

TABLE 34.

Year.	Males to 100 females					
	In living-births.			In still-births.		
	Total.	Legitimate.	Illegitimate.	Total.	Legitimate.	Illegitimate.
1899....	105·9	106·0	105·7	109·7	110·7	105·6
1900....	105·1	105·1	104·7	110·7	111·4	107·9
'01....	105·1	105·2	104·1	110·7	112·3	105·8
'02....	104·9	105·0	103·6	110·9	111·9	107·7
'03....	105·2	105·5	102·6	110·1	111·1	107·0
'04....	105·1	105·3	103·9	110·2	110·5	109·0
'05....	102·7	102·9	100·7	109·5	110·1	107·5

5. *Legitimate and illegitimate births.*—The following are the figures for recent years respecting legitimate and illegitimate births:—

TABLE 35.—*Legitimate and illegitimate births.*

Year.	Legitimate.			Illegitimate.		
	Living-births.	Still-births.	Total.	Living-births.	Still-births.	Total.
1899....	1,282,888	109,707	1,392,595	104,093	25,520	129,613
1900....	1,305,726	109,063	1,414,789	114,805	28,457	143,262
'01....	1,374,196	119,678	1,493,874	127,395	35,372	162,767
'02....	1,381,130	121,076	1,502,206	129,705	36,122	165,827
'03....	1,361,997	118,366	1,480,363	127,819	35,094	162,913
'04....	1,318,709	114,287	1,432,996	121,662	32,373	154,035
'05....	1,331,625	110,889	1,442,514	121,147	30,849	151,996

Of course the legitimate births form the great majority of births, viz., over 90 per cent. of the total, the illegitimate forming 8·5 to 10 per cent. of the total. This percentage of the illegitimate is similar to that of some countries such as Denmark, Germany and Austria, which have no inconsiderable illegitimate birth-rate. Of the total still-born about 80 per cent. are legitimate and about 20 per cent. illegitimate. During the period considered the proportion of the illegitimate to the total births does not seem to show any tendency to decrease, as the figures below indicate :—

TABLE 36.

Year.	Illegitimate in 100 living-births.	Illegitimate in 100 still-births.	Illegitimate in 100 births.
1899.....	8·3	19·0	8·5
1900.....	8·8	20·8	9·2
'01.....	9·3	23·0	9·8
'02.....	9·4	23·2	9·9
'03.....	9·4	23·1	9·9
'04.....	9·3	22·3	9·7
'05.....	9·2	22·0	9·5

I have already stated that the number of the still-born is very remarkable in Japan, and now we see that this is especially the case with the illegitimate in contrast to the legitimate births. As will be seen from the following figures, the percentage of the still-born in the legitimate births is about 8 per cent., while it is about 20 per cent. in the illegitimate, that is, about one-fifth of illegitimate children are returned as still-born, a fact worthy of our serious attention :—

TABLE 37.

	Still-born in 100 legitimate births.	Still-born in 100 illegitimate births.		Still-born in 100 legitimate births.	Still-born in 100 illegitimate births.
1899	7·9	19·7	1903	8·0	21·5
1900	7·7	19·8	'04	8·0	21·0
'01	8·0	21·7	'05	7·7	20·3
'02	8·1	21·8			

IV. Deaths.

1. *Number of deaths.*—The total number of deaths inclusive of the still-born during the twenty years from 1886 to 1905 is as follows :—

TABLE 38.—*Number of deaths (deaths of the legal population and still-births of the actual population).*

	Number of deaths.	Ratio per 1,000 inhabitants.		Number of deaths.	Ratio per 1,000 inhabitants.
1886	996,693	25.9	1896	1,040,035	24.4
'87	814,321	20.8	'97	907,074	21.0
'88	830,329	19.0	'98	1,020,365	23.3
'89	893,931	22.3	'99	1,070,293	24.2
'90	915,470	22.6	1900	1,052,544	23.5
'91	944,528	23.2	'01	1,084,067	23.9
'92	992,540	24.2	'02	1,119,805	24.3
'93	1,046,515	25.3	'03	1,087,754	23.3
'94	953,936	22.8	'04	1,146,679	24.2
'95	969,637	22.9	'05	1,186,947	24.9

On looking at these figures, excluding the first year (1886), which shows a great number of deaths owing to the prevalence of cholera in that year, we see that the number of deaths rose gradually from over 800,000 to over 1,000,000. The rate per 1,000 inhabitants has always, except in 1888, exceeded 20 per thousand, and generally has fluctuated between 23 and 25 per thousand.

If we average the figures of every quinquennium, we see that the annual average number of deaths increased from 890,149 during the first five years to 1,125,050 during the last five years, and the rate rose from 22.5 per thousand to 24.3 per thousand. It is a fact worthy of attention that our figures show a different tendency to those of other civilised countries, in which the death-rate is usually decreasing, but it must be borne in mind that the increase in still-births accounts for part of the rise.

	Average number of deaths per annum.	Ratio per 1,000 inhabitants.
1886-90	890,149	22.5
'91-95	981,431	23.7
'96-1900	1,018,062	23.4
1901-05	1,125,050	24.3

Such is the general tendency of the number of deaths in recent years, but the annual figures, of course, present many fluctuations. Thus the figures of 1886 show a great rise owing to the prevalence of cholera, as already stated, to which over 1,070,000 people succumbed. The figure for 1893 shows a fairly marked rise to 25.3 per thousand, for which, however, I am unable to assign any sufficient reason. The rate in 1905 rose to 24.9 per thousand, probably owing to the Russo-Japanese war.

We also give below the figures relating to deaths exclusive of the still-born in this period, which are more fit for international comparison than those inclusive of the still-born. These figures show almost the same general tendency :—

TABLE 39.—(i) *Number of deaths of the legal population, exclusive still-births.*

	Number of deaths, exclusive still-births.	Ratio per 1,000 inhabitants.		Number of deaths, exclusive still-births	Ratio per 1,000 inhabitants.
1886	938,343	24.4	1896	912,822	21.4
'87	753,456	19.3	'97 ...	876,837	20.3
'88	752,834	19.0	'98	894,524	20.4
'89	808,680	20.0	'99	934,566	21.1
'90	823,718	20.4	1900	914,557	20.3
'91	853,139	21.0	'01	928,578	20.3
'92	886,908	21.6	'02	962,097	20.9
'93	937,644	22.7	'03	933,834	20.0
'94	840,768	20.1	'04	999,621	21.2
'95	852,422	20.2	'05	1,044,855	21.9

(ii). *Quinquennial averages.*

	Average number of deaths (exclusive still- births) per annum.	Ratio per 1,000 inhabitants.		Average number of deaths (exclusive still- births) per annum.	Ratio per 1,000 inhabitants.
1886-90....	815,406	20.6	1896-1900	906,661	20.8
'91-95....	874,192	21.1	1901-05	973,797	21.1

2. *Deaths and season.*—The number of deaths in different months has fluctuated greatly, as will be seen from the following table:—

TABLE 40.—*Number of deaths (exclusive still-births) in each month of a year.*

Month.	1899.	1900.	1901.	1902.	1903.	1904.	1905
January	78,547	85,869	74,627	85,155	79,888	89,804	82,264
February	69,157	84,246	77,374	76,412	74,385	81,473	85,472
March	71,786	90,722	85,297	76,476	75,771	84,480	89,230
April	63,997	68,389	67,881	70,420	66,696	71,670	75,858
May.....	63,534	64,247	66,312	69,365	68,845	71,047	73,462
June	64,105	60,848	62,102	67,762	64,079	68,813	71,526
July.....	82,000	67,686	74,563	80,221	75,135	80,273	91,337
August	99,184	81,861	88,690	99,097	92,045	91,476	103,336
September	97,153	83,262	92,563	100,251	87,261	85,099	95,988
October	88,987	79,806	82,258	86,864	84,729	77,655	84,072
November	77,003	68,727	74,007	72,798	77,483	76,523	75,645
December	76,546	74,915	80,075	74,231	84,143	77,019	76,158
Unknown	88	56	61	74	47	68	43
Total	932,087	910,744	925,810	959,126	931,008	955,400	1,004,661

If we take as examples the figures of the two years 1899 and 1905, and treat their averages per day in each month as has been done in former sections of this paper, we find that the figures of both years agree in so far that most deaths occur in August and September and fewest in May and June, see the following table:—

TABLE 41.

Month.	1899.		1905.	
	Average of deaths per day.	Ratio of the average of deaths per day in each month to the average of deaths of a year taken as 100.	Average of deaths per day.	Ratio of the average of deaths per day in each month to the average of a year taken as 100.
January.....	253	99.2	265	96.4
February	247	96.7	306	111.2
March	232	90.6	288	104.5
April ..	213	83.5	253	91.8
May	205	80.2	237	86.0
June	214	83.6	238	86.6
July	265	103.6	295	107.0
August	320	125.2	333	121.1
September.....	324	126.8	320	116.2
October	287	112.3	271	98.5
November	257	100.5	252	91.6
December	247	96.6	246	89.2
Average of a year....	255	100.0	275	100.0

Similar results are obtained with the figures of other years. That is to say, most deaths occur in the season of intense heat or in the late summer, and fewest in the late spring or in the early summer.

3. *Deaths classified by sex and age.*—To compare the death-rates of males and females I have only been able to utilise the returns of deaths from 1899 to 1903, because it is only for this period that the necessary data are available. The result is, as will be seen in the following figures, that the death-rate for males is 20.73 per thousand, and for females 20.44 per thousand, *i.e.*, the former is a little greater than the latter.

1899-1903.

	Male.	Female.
Average number of deaths per annum	473,501	458,247
Death-rate per 1,000 male or female } population	20.73	20.44

Now, let us further investigate the death-rates for the two sexes at successive ages. As shown in Table 42, based on my own calculations for the figures from 1899 to 1903, for children under 5 the male death-rate is 61.15 per thousand as compared with the female death-rate 56.24 per thousand, while between the ages 5 to 35 the female death-rate always exceeds the male, and again at ages above 45 the male death-rate exceeds the female.

TABLE 42.—1899-1903.

Age-class.	Average number of deaths per annum.		Deaths of males per 1,000 male population of each age-class.	Deaths of females per 1,000 female population of each age-class.
	Male.	Female.		
Not exceeding 5	176,304	157,628	61.15	56.24
Over 5 and not exceeding 10	13,407	15,466	5.45	6.43
" 10 " 15	7,637	9,873	3.38	4.47
" 15 " 20	13,770	17,222	6.04	8.07
" 20 " 25	17,352	19,952	8.34	9.80
" 25 " 30	13,597	17,175	7.64	9.94
" 30 " 35	12,016	14,856	7.69	9.90
" 35 " 40	12,443	14,321	9.00	10.88
" 40 " 45	14,343	13,713	11.26	11.44
" 45 " 50	18,591	14,150	14.78	11.96
" 50 " 55	22,286	16,399	20.23	15.63
" 55 " 60	25,359	18,763	28.40	21.47
" 60 " 65	25,610	20,231	39.81	30.46
" 65 " 70	28,841	25,461	61.18	48.59
" 70	71,894	85,017	116.10	106.75
Total average.....	473,501	458,247	20.73	20.44

Concluding remarks.—We have now finished our brief survey of the movement of the population in Japan, which exhibits many points in common with other civilised countries, as well as certain peculiarities. Of course there are many other problems of interest, scientific and practical, to be considered. More detailed investigations might be made as to the conditions in the different local governmental districts, or in urban and rural districts, or as to the relation between the phenomena considered and occupations. But we have not attempted such studies on the present occasion, partly as we wished to give a more general view, and partly on account of the insufficiency of the materials.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*A first study of the influence of parental alcoholism on the physique and ability of the offspring*. (Eugenics Laboratory Memoirs. X.) By Ethel M. Elderton, Galton Research Scholar in National Eugenics, with the assistance of Karl Pearson, F.R.S. 46 pp., 4to. London: Dulau and Co., 1910. Price 4s.

In this memoir Miss Elderton has applied Professor Pearson's methods, with his assistance, to two sets of data which she found ready to hand. Although the discussions of the two sets are not kept in the memoir quite separate, and one is held to corroborate the other, they relate to two entirely distinct problems which are better discussed separately.

The first of these problems is concerned with the question whether the families of *sober* parents, which contain at least one feeble-minded member, are better or worse in other respects than the families of *drunken* parents which contain at least one feeble-minded member. From the actual evidence, collected in Manchester and examined by Miss Elderton, only two facts clearly emerge—(1) that the proportion of phthisical and epileptic cases amongst the other members of families, one member of which is feeble-minded, is for both sexes *twice* as great where the parents are temperate than where they are intemperate; and (2) that the proportion of feeble-minded children to normal is somewhat greater in the families of sober parents. The death-rate is sensibly greater amongst the children of intemperate persons, but in other respects there is not much to choose between the two.

As no details are given regarding the manner in which the evidence was collected, and as the number of cases was somewhat

small, the data, whatever they may suggest, can prove little. To the authors of the memoir they seem to have suggested that the influence of alcoholism on offspring is insignificant. But it is clear that this comparison with *bad* sober stock can throw very little light on the effect of alcoholism on otherwise normal families. And with regard to the question whether alcoholism increases the tendency to feeble-mindedness—since we find the sober families to be worse in other respects than the drunken families, the conclusion of the memoir is at least no more plausible than the contrary conclusion, that in the sober families the feeble-mindedness of the child was due to the general badness of the stock, whereas in the drunken families, for which there is less evidence of general deterioration, the feeble-mindedness of the child may have been due to the alcoholic condition of one or both of the parents during the period preceding its birth.

Before leaving this part of the memoir it may be worth while to call attention to the fact, not explicitly stated in it, that 24 per cent. of the fathers and 14 per cent. of the mothers of the feeble-minded children were classified as alcoholic. At Nottingham¹, where the families of 300 feeble-minded children were investigated, 25 per cent. of these families were found to be alcoholic. These results are in close agreement. But as the proportion of alcoholic families in the population at large cannot be so high as 25 per cent., the evidence suggests a connection between feeble-mindedness and alcoholism, rather than the contrary.

The second investigation is concerned with a much more definite and important problem. It examines all the children, about 1,400 in number and drawn from nearly 700 families, who were attending a certain school; and it is claimed that they fairly represent a random sample of the population. The authors find that whether we take the height, the weight, the general health, the intelligence, or the eyesight of the children, there is little to choose between the offspring of drunken and of temperate parents; and that where there is anything to choose, as in the cases of general health and of eyesight, the advantage is with the children of the drunkard. It is only in the infantile death-rate that the sober families are sensibly superior. These results are, as the authors admit, sufficiently surprising; but they are concordant, they claim, with the conclusion to which all the work at the Eugenics Laboratory points, that in general the influence of environment on human character is inappreciable. "We seem forced to admit," they conclude, "either that for the types of environment dealt with this influence is very small, or that the data are completely untrustworthy." Of the two alternatives, it is the former that they prefer.

Before we consider the trustworthiness of the data in this particular case, there are two points of statistical method in which the memoir seems open to criticism. In the first place no adequate attempt is made to display to the reader the real character of the evidence upon which it is based. As in an investigation of this kind the value of the conclusion mainly turns upon the trustworthiness of

¹ See article by E. Powell in *Economic Review*, 1906.

the original material to which the mathematical machinery is applied, everything ought to be said, that can be, to enable the reader to form some sort of independent judgment respecting it. We wish to know, for instance, in what manner and for what purpose the evidence was collected and tabulated by the original investigators; and we require somewhat full evidence that the cases dealt with really do supply us with a fair sample of the population at large. But on these matters the memoir is almost silent.

In the second place, it may be doubted whether, in several instances, anything has been gained by the calculation of coefficients of correlation. Professor Pearson has clearly shown that, when the number of instances is relatively small, a low apparent correlation cannot be regarded as numerically significant. The tables in this memoir are not at all complex, and in most of them it can be easily seen with the naked eye that no significant degree of correlation is present. The elaborate calculations, upon which an immense amount of trouble must have been expended, and the careful corrections for age and so forth are, therefore, labour wasted. Miss Elderton has spent her time and her manifest skill on material which, it should have been obvious from the beginning, could not repay her. Trouble which might have been better spent on improving the original material has been needlessly expended on computations, which add little to our knowledge, and which confuse, though they may also impress, all readers outside a very restricted class.

What, finally, is the character of the evidence upon which these startling conclusions have been based? They contradict general experience, which is, after all, based, though vaguely, upon a vastly more numerous and more varied set of instances than this single experiment. And they contradict also the general tenor of scientific opinion, in so far as this was expressed before the recent Departmental Committee on Physical Deterioration. Furthermore, physiologists can tell us ways in which it is at least *possible* for parental alcoholism before the birth of a child to affect it *ab initio*, and social workers of experience describe to us how it is *likely* for many reasons that parental alcoholism after the child's birth will injure its development. We ought not to put much faith in a contrary conclusion until we are satisfied (1) that the experiment is on a considerable scale; (2) that the classification—in this case into alcoholic and non-alcoholic—has been skilfully and uniformly carried out; (3) that its field is truly representative of the population at large.

It is not possible to obtain satisfactory information as to the second and third heads from the memoir itself, but the original material has, fortunately, been published by the Edinburgh Charity Organisation Society, under whose auspices it was collected. With regard to classification, the most striking fact is this, that *out of the whole number of families no less than 62·5 per cent. are classified or suspected as alcoholic*. This astonishing figure, showing that more than half the wage earners of the district are alcoholic, is not to be found in the memoir, although the proportion of

alcoholics in each sex can be worked out from the figures in the appendix. It casts doubt, at once, upon the whole investigation, and suggests *either* that the classification into alcoholic and non-alcoholic is misleading, *or* that the selected district is thoroughly unrepresentative. If we turn to the original document we find overwhelming evidence in favour of the second alternative.

There are, however, one or two remarks which may be made before we leave the question of classification. The Edinburgh Report treats, according to its title, of the physical condition of 1,400 school children in the city, together with some account of their homes and surroundings. The effects of alcoholism were not specially in view, and, while a good attempt has been made to record drunken habits where they were noticeable, it is clear from a reading of the detailed accounts that the merest hearsay evidence had often to be accepted, and that in many cases no substantial evidence either way was obtained. No blame attaches on this account to the investigators. Their report succeeds wholly in its attempt to give a vivid and accurate picture, checked and illustrated by statistics, of the child life of the district. It was no part of their purpose to collect figures in a form in which they could be accurately used for such calculations as Miss Elderton's. Nor does it seem that the Edinburgh investigators are themselves in agreement with the conclusions which have been derived from their report. "Much of the degradation of the people and the suffering of the children," says the preface, "is plainly and irrefutably attributable to an excessive indulgence in strong drink." It is conceivable of course that the sufferings of the children might not be reflected in their height, weight, health, or intelligence; but it does not seem likely. It may be added that Miss Elderton has classified as alcoholic those doubtful cases who were suspected of drink, and that there is in general no evidence as to the habits of the parents at the time of the birth of the children, many of them eleven or twelve years of age,—a point of some importance.²

Does the Edinburgh Report confirm the contention of Professor Pearson and Miss Elderton, that it deals with a fair sample of the general population? They base their confidence, apparently, upon a statement in the introductory note that the selected school had a widely representative character. But it is not possible to read very far before it becomes plain that a large proportion of the families are living under the worst slum conditions, and that in 75 or 80 per cent. of the cases one parent at least is drunken, or for some other reason mentally or physically enfeebled. The following facts, which the authors of the memoir have not thought it worth while to record, deserve attention:—

² Cf. the evidence of Dr. T. Claye Shaw before the Committee on Physical Deterioration: "We must be careful to eliminate, in the case of the father, the time when he became an excessive alcoholic. One often sees the later members of a family of worse development than the earlier ones, because the father began his excessive indulgence after the earlier children were begotten."

(1) In 62.5 per cent. of the families, one parent at least drank, or was suspected of drink.

(2) 57.5 per cent. of the families were in receipt of charitable aid.

(3) 48.5 per cent. of the *sober* families were in receipt of charitable aid. Only 19 per cent. of the families, therefore, were neither drunken nor in receipt of charitable aid.

(4) 74 per cent. of the families were living in one or two-roomed tenements.

(5) The average height of the children in the selected school was age for age 2 inches less than in the Edinburgh Public School. For boys of 14 it was 3 inches less, and for girls of 14 it was $4\frac{1}{3}$ inches less. If we take the Edinburgh Higher Grade School, the difference (except in the case of girls of 14) is even more marked, the boys of 14 in the selected school being on the average *more than 6 inches shorter*. All these figures are for Edinburgh, so that racial differences ought to be unimportant. The authors deal elaborately with the question of the height of the children, but omit all reference to these vitally important facts, which they must have read in the Edinburgh report. Nothing could be suggested more plainly than that these stunted children are the product of environment.

(6) The average weight of the children is below the normal to a similar extent, and the deficiency becomes more marked as the children grow older. Boys of 14 weighed on the average 21 lbs. less than in the Edinburgh Public School, 18 lbs. less than in the Higher Grade School; girls of 14 weighed 23 lbs. less than in the Public School, 25 lbs. less than in the Higher Grade School. These figures also the memoir omits and ignores. Both for weight and height a comparison with the Anthropometric Committee's average leads to similar results. It may be added that a comparison with the schools examined in Edinburgh and Aberdeen for the Commission on Physical Training shows some defects of sight less and others more prevalent in the selected school, and that throat conditions were more favourable than in similar schools in Glasgow.

This review has already extended to too great a length to permit of further detailed criticism. In spite of the fact that many of the drunken families had good earnings, and in spite of an admixture of well-to-do sober families, far too few in number to affect the results appreciably, the impression deepens as one reads the detailed evidence that the children are mainly drawn from a degraded district. As in the Manchester case, so *on the whole* in the Edinburgh case the authors are comparing drunken stock with *bad* sub-normal sober stock, and find, naturally enough, that there is not much to choose between them. As a contribution to the solution of the general problem the memoir is almost valueless, and, from its failure to direct the reader's attention to essential facts, actually misleading. As a study in statistical method it is a salient example of the application of a needlessly complex mathematical apparatus to initial data, of which the true character is insufficiently explained, and which are in fact unsuited to the problem in hand.

J.M.K.

2.—*Krankheits- und Sterblichkeitsverhältnisse in der Ortskrankenkasse für Leipzig und Umgegend. Untersuchungen über den Einfluss von Geschlecht, Alter und Beruf.* Bearbeitet im Kaiserlichen Statistischen Amte. 4 vols., 4to. Berlin: Carl Heymann, 1910.

While mortality statistics must always be placed first in importance among the data of a medical statistician or hygienist, many facts, a knowledge of which is urgently necessary not merely to the man of pure science but also to the statesman, cannot be furnished by a study of even the most complete death returns. The loss of time due to illness, the ease mortality, or fatality, of common diseases, and the relations between these and age, sex, or social status, are problems of first-rate importance for the study of which but little information is available in this country.

The authorities of the Imperial German Statistical Department being conscious of the importance of an investigation of this kind, have analysed the data collected in the Leipzig Krankenkasse, and the results of their inquiry are contained in the four large volumes under review. The first volume opens with an account of the methods adopted in collecting the data, which refer to nearly a million males and more than a quarter of a million females, who have been under observation for at least twelve months. The methods of classification, both of diseases and occupations, are fully explained. The differences in regard to number of days of illness between males and females at comparable ages and between the obligatory (*versicherungspflichtig*) and voluntary (*freiwillig*) members of the "Krankenkasse" are described; the complications introduced by the legal requirements as to number of weeks during which sick money is paid, the determination of the proportional numbers of persons who pass out of benefit, the differences which would result were the period of benefit extended, &c., are exhaustively studied. The average duration of illness, the fatality, and the total mortality in five and ten yearly age groups for different classes of allied diseases, are all determined. Similar tables are provided for each group of occupations. The tabulation of these data occupies almost the whole of the three last volumes. As an illustration of the method of using the tables, the morbidity of two large industrial groups, gardeners and allied open-air workers on the one hand, and compositors, type founders, lithographers, and other indoor employes, under approximately similar conditions, on the other, are exhaustively compared. At each stage in the investigation possible fallacies and difficulties of interpretation are pointed out with scrupulous fairness.

It will be obvious from the last paragraph, which merely summarises some of the contents, that any attempt to review adequately an undertaking of this magnitude would demand a volume. We shall, therefore, merely refer to some points of particular interest to ourselves.

One of the objects had in view by the authors was the construction of a morbidity table, since their material was a numerically adequate sample of the *industrial* population of Germany, or rather of those trades upon the members of which sickness insurance is obligatory. Now although such a table as they construct is of

considerable significance when very wide categories of disease are adopted and when the somewhat select type of material is borne in mind, great difficulties arise when an attempt is made to subdivide the material; accordingly the authors do not attempt to construct morbidity tables for special diseases. The medical statistician is, however, specially anxious to learn the fatality of well defined common diseases and the present work shows how difficult it is to obtain this information. For instance, lobar pneumonia is a disease of common occurrence presenting a rather definite clinical picture, so that errors of diagnosis although unavoidable in some cases are perhaps not relatively common. What is the average case mortality of this disease? The only long series of cases obtainable in this country relate to hospital experience. Thus the present writer and Mr. R. H. Candy find the following results for the London Hospital, 1854-1903. (A separate comparison for decennia, having regard to the probable errors, showed no definite secular change in fatality.)

London Hospital male patients, 1854-1903.

Age.	Number of cases.	Number of deaths.	Percentage case mortality.	Age.	Number of cases.	Number of deaths.	Percentage case mortality.
16-20...	551	53	9.62	41-45	223	85	38.12
21-25....	450	60	13.33	46-50	165	73	44.24
26-30....	405	103	25.43	51-55	108	43	39.81
31-35....	314	94	29.94	56-60	68	39	57.35
36-40....	320	121	37.81				

Similar figures for male members of the Leipzig Krankenkasse (obligatory members) are :—

Age.	Number of cases.	Number of deaths.	Percentage case mortality.	Age.	Number of cases.	Number of deaths.	Percentage case mortality.
15-19....	596	23	3.86	40-44	361	62	17.17
20-24....	459	32	6.97	45-49	281	57	20.28
25-29 ..	438	56	12.79	50-54	187	47	25.13
30-34....	417	50	11.99	55-59	130	43	33.08
35-39....	392	61	15.56				

When due allowance has been made for the errors of sampling and for the fact that the hospital grouping begins one year later than the German returns, the difference in fatality rate is sufficiently striking. The main cause of this, setting on one side problematical effects of nationality and the likelihood that the hospital cases are more accurately diagnosed, is doubtless the fact that hospital patients are largely recruited from the ranks of casual labour and represent a class economically inferior to that of the German material. It is not, we think, probable that the difference is merely due to the hospital only admitting grave cases, since it is the practice to admit *all* definite cases of lobar pneumonia. Two important conclusions can be drawn. One is that hospital statistics, practically the only extensive material available in this country, may give the medical student and layman quite false ideas as to the fatality of ordinary

non-notifiable diseases; the other is that the *data* of the German Krankenkasse tend to give a somewhat too favourable idea of general morbidity conditions. The truth lies between these extremes; its discovery is a worthy object of statistical research.

We have dwelt upon this point since it serves to illustrate the complexity of the problems confronting the medical statistician. His cry must always be for *data*, for more *data* and again for *data*. In the volumes before us he will find an ample first instalment. We only allow ourselves one small complaint. A large book of this kind, which is wanted for frequent reference, would be much more convenient if issued bound, and not in flimsy paper covers. M.G.

3.—*La répartition des fortunes en France.* Par J. Séailles. iii + 142 pp., 8vo. Paris: Félix Alcan, 1910. Price 5 francs.

The author of this suggestive essay, certain points in which have already been discussed in this Journal by Mr. H. C. Strutt (pp. 634—644), has started from the standpoint of Pareto's work on the distribution of incomes to obtain statistical evidence of the law of distribution of wealth in France. He was not primarily concerned to discover the total mass of wealth, but only its relative distribution.

The preface contains some excellent suggestions to the revenue authorities as to the statistical information which it is most desirable they should afford, and the introduction contains an historical account of previous work upon the facts of the distribution of wealth. Our author then proceeds to discuss the material available for his research, and finds that the only suitable statistics are those obtained in connection with the assessment of the French succession duty. He subjects the official figures to an exhaustive and suggestive discussion as regards their inherent errors. The next chapter gives us the preliminary results which he obtains from the statistics, leading up to the important figures contained in the following table, relating to the number and value of fortunes transmitted, and of portions received by heirs, both classified in groups according to value:—

Groups according to value of estates transmitted and portions received.		Numbers of transmissions in groups.	Total value of transmissions in each group.	Numbers of portions received in groups.	Total value of portions received in each group.
		Per cent. of whole number.	Per cent. of total value.	Per cent. of whole number.	Per cent. of total value.
1 to	500	30·51	0·58	51·157	1·94
501 „	2,000	26·86	2·46	24·676	5·36
2,001 „	10,000	27·56	9·76	14·896	13·75
10,001 „	50,000	11·31	17·52	4·775	20·58
50,001 „	100,000	1·85	9·35	0·787	10·79
100,001 „	250,000	1·19	13·48	0·473	14·26
250,001 „	500,000	0·41	10·56	0·147	10·09
500,001 „	1,000,000	0·19	9·97	0·057	7·57
1,000,000 „	2,000,000	0·09	8·12	0·022	5·86
2,000,000 „	5,000,000	0·029	7·20	0·007	4·49
5,000,000 „	10,000,000	0·006	3·88	0·001	1·70
10,000,000 „	50,000,000	0·002	3·17	0·000	1·82
Over 50,000,000		0·000	3·15	0·000	1·77

A graphic comparison of the figures for portions received with those of fortunes transmitted leads the author to the interesting conclusion that the dispersion of fortunes is greater in the case of small fortunes than of large, due probably to the higher birth-rate amongst the poorer classes. There is thus a tendency for mere lapse of time to accentuate the inequality of the distribution of wealth.

The figures of fortunes transmitted show that, at the age of death, 57·37 per cent. of the persons possessing any property at all possess only 3·04 per cent. of the total wealth transmitted. The question of the relation of distribution amongst the living to that ascertained for the dying is next attacked with the help of the figures for 1906, the only year for which official figures classifying successions by age-groups are available. The author concludes that "the distribution amongst proprietors, as represented by the curve and the numbers which we have given, is a mean term between the *more unequal* distribution which exists in the mass of proprietors of *all ages* in the *total* population of France and the *more equal* distribution which exists amongst proprietors of *equal age*, or, at least, met with in a single generation."

The third and last chapter is appropriated to a discussion of the law of distribution itself. Pareto, from his study of English income-tax data, concluded that, where X is the value of any particular estate, and N the number of estates equal to, or greater than X , the distribution of incomes might be represented by the formula $\log N = \log A - \alpha \log X$; because, when logarithms of the figures are plotted, they give a line which is nearly straight—only slightly concave towards the origin. M. Séailles's figures for fortunes transmitted, plotted in the same way, give a curve essentially parabolic in character, with its axis coinciding with the axis A (English Y), and corresponding with the formula $(\log X)^2 = 2p \log N + q$. He argues that this must be the true form of the curve for incomes also, because they cannot become indefinitely great in number or small in amount; and that Pareto would have found it so had the English statistics included incomes below 150*l.* per annum.

There follow as appendices an essay on the "Problem of the Distribution of Wealth" which contains nothing of economic or statistical importance; a reprint of Pareto's essay, "Sur la Courbe de la Répartition de la Richesse," which was published at Geneva in 1896 by the University of Lausanne; and an essay by M. Séailles in which he makes an estimate of the absolute amount of the total private wealth in France, a problem which did not enter into his principal thesis. Using the death duty statistics, and taking ratios of living to dead by age-groups, he arrives at the conclusion that the real multiplier lies between 38 and 40, and adopts 38·97. Allowing 750,000,000 francs as the value of property which passes without official cognisance, he obtains a figure of about 240,000,000,000 francs for the total wealth.

The book is rather a strange mixture of popularly written matter with highly technical scientific discussions; but it will be of interest to many students of the statistics of distribution, and to all who concern themselves with estate duty statistics. H.S.J.

4.—*Teoria statistica, generale e demografica*. By Professor Aldo Contento, Pic. Bibl. Scientifica, Soc. Ed. Libreria. Milan, 1909. 1 vol., part I, viii + 296 pp.; part II, 330 pp. *Manuale di demografia* (part II of *Statistica e demografia*). By Professor N. Colajanni. 2nd Edition. viii + 747 pp. Naples: L. Pierro, 1909.

Professor Contento has issued a pocket text-book of statistical theory and practice intended for the use of university students. The book only pretends to be a text-book, intentionally covering a wide ground without going into great detail, and leaving the student to turn to larger works for more intensive study. The book is in two parts, dealing respectively with theoretical statistics and the practical application of statistical methods to the problems of population (demography). Professor Colajanni has treated his subject similarly, though his book has a different purpose. The *Manuale di demografia* forms the second part of *Statistica e demografia*, the first part having been concerned, as in the case of Professor Contento's text-book, with what may be called pure statistics. The manual is, however, intended for a different class of reader. Although nominally only the second edition of an earlier work, it forms practically a new book, the first edition having been added to and rearranged as well as brought up to date. The author, in complaining of the excessive labour involved in thus transforming a book, declares that his efforts will be duly rewarded if it should prove that the manual, rather than a more essentially didactic work, becomes a book generally read by cultured Italians, and if it succeeds in awakening in Italy a more real interest in, and appreciation of, demographic problems. But we can hardly imagine a very wide circle of readers for a treatise of the kind, especially as the book, if intended for the use of politicians and social reformers, has the serious drawback of not possessing an index. The same omission is to be noted in Professor Contento's text-book, though presumably an index is not so necessary for undergraduates expected to study the subject from cover to cover.

The second part of the text-book covers largely the same ground as Professor Colajanni's manual, though the treatment differs in a manner generally corresponding to the difference in the objects which the respective authors have in view. The two Professors agree that statistics should be treated only as a method applicable to many sciences, amongst which demography is one, and they explain their special consideration of applied statistics in relation to that particular subject by its paramount importance and suitability for statistical treatment.

Both authors divide their study of demography into what we may call the statics and dynamics of population. But here the similarity ends. Professor Contento in each section of his demography follows out the scientific order adopted in the theoretical part of the book. He divides his subject into two parts—the technical and the logical. The technical side he sub-divides into (1) methods of investigation, (2) the manipulation of data (mathematical calculations and formulæ), and (3) the representation of data (graphical methods, &c.); and on the logical side, he

considers the interpretation and examination of data with a view to determining the laws governing the phenomena under consideration. Thus he considers statistics of population—both static (number of inhabitants, age, &c.) and dynamic (marriages, births, deaths, migration)—under these successive heads. Professor Colajanni, on the other hand, with a different object in view, presents in as attractive a form as possible figures and observations, treating, on the static side, of population (density, &c.), number of communes, families, &c., anthropological characteristics, races, languages, &c., places of origin, biological conditions, age, infirmities, social conditions (civil status, religion, education, occupations); and on the dynamical side, of what he calls intrinsic variations in population (marriages, births, morbidity, &c.), and extrinsic variations (migration, emigration, immigration, &c.), ending with a discussion of the causes of demographic variations, the theory of population, and probable conditions in the future. Both books have something to say on the historical side. But where the manual contains historical notes interspersed amongst statistical considerations, Professor Contento devotes the first chapter of his text-book to the historical development of statistics, with a view not only to the instruction of his students, but also to justifying his conceptions of the true functions of statistics.

The criticisms of the existing organisation of university faculties in Italy, to which Professor Contento gives vent in his opening remarks, may be of interest to those concerned in university administration. S.S.

5.—*A short history of English Agriculture.* By W. H. R. Curtler. 371 pp., 8vo. Oxford: Clarendon Press, 1909. Price 6s. 6d. net.

British agriculture, as it now exists, is the product of many centuries, and rightly to understand its present position some knowledge of its past is essential. For the acquisition of such knowledge the material is plentiful enough, but the subject is so wide and complex that even a student may be disheartened, and the man who desires to obtain only a general survey may shrink altogether from the task. Many recent writers have made a strong appeal to the general reader by reason of the intrinsic interest of their subject, or the charm of their literary presentation of it, but they are, and claim to be, only sectional. Mr. Curtler makes a wider appeal. He presents a summary of the events, the facts, and the influences which have set the course of British agriculture from the Norman Conquest to the present day. Within the limits he has set himself it is perhaps hardly to be expected that his description of the political, social, and economic forces which moulded the land system of this country should be regarded as entirely adequate, but the salient facts are clearly indicated. It is, however, as a history, clear and concise, yet often detailed, of the progress of the art and science (for it is both) of agriculture that this book is most welcome and noteworthy. The author traces the gradual improvements in the practice of farming from one generation to another. In the beginning was the common field, with its three (sometimes probably two) course rotation dominating the whole system of farming and precluding all

possibility of change or progress. Gradually the individual occupation of land, allowing scope for personal initiative and energy, made progress possible, and step by step farming improved. For about three hundred years after the Conquest the cultivation of arable land was the main object of farming. No doubt the proportion of land then under the plough was very large, though the figures usually given in support of this contention cannot be regarded without scepticism. Mr. Curtler, for example, cites two instances. In 1086 he says the arable land in Somerset was 577,000 acres, and in Gloucestershire 589,000 acres, and he notes that in 1907 the corresponding figures were for Somerset 178,967, and for Gloucestershire 238,456 acres. The total area of Somerset is little over 1,000,000 acres, of which 854,000 acres are farmed at the present time, and only 176,000 acres are arable. Similarly in Gloucestershire the total extent of the county is about 800,000 acres, of which 657,000 are now farmed, 234,000 acres being arable. It is hardly credible that a thousand years ago more than half each of these counties was actually ploughed. The truth is that there are no agricultural statistics of any real value for that date. Ingenious computations have been made, based on disputable deductions from imperfect data, but to allow the figures thus obtained the title of statistics is hardly permissible in the pages of this *Journal*. Practically the first calculations which can be termed agricultural statistics are those of Gregory King in the latter part of the seventeenth century. His calculations have an air of carefulness, and they are at any rate fairly consistent with the facts as we now know them. For example, he reckoned the total extent of England and Wales at 39,000,000 acres; we now know it to be rather less than 37,500,000 (37,339,000). He estimated the arable land at 9,000,000 acres, pastures and meadows at 12,000,000, and woods and coppices 3,000,000. The ascertained figures now are about 11,500,000, 16,000,000, and 2,000,000 respectively. Mr. Curtler quotes Gregory King's figures, and in the concluding chapters of his book and also in the appendix he gives some statistics from the agricultural returns, while throughout he gives for different periods from various sources much interesting information as to prices, wages, and rents. In referring to enclosures he scarcely represents fully the effect of the Act of 1845. He states that since that date 80,000 or 90,000 acres "of common arable fields and meadows" have been enclosed "without parliamentary sanction"—an estimate which must necessarily be very doubtful—"and 139,517 acres of the same have been enclosed with it besides many acres of commons and waste." The actual extent of land enclosed under the Inclosure Act of 1845 was 618,000 acres, in addition to 30,000 acres since the Commons Act, 1876, was passed.

Mr. Curtler is for the most part content to chronicle facts without undue comment, but his passing observations are pertinent. His remark that "agriculture under feudalism suffered from many of the evils of socialism" is timely, when some modern land reformers appear to think that true progress is to be found in a reversion to mediæval methods. There is shrewdness also in the

description of the life of the rural labourer in the middle ages. The author sums up its drawbacks thus: "No books, no newspapers, no change of scene by cheap excursions, no village school, no politics." It is, perhaps, doubtfully true to say that the fourteenth century labourer had no politics—he had rather a tendency to violent politics—and it is to be feared that the modern labourer would feel the absence of bicycles almost as keenly as the lack of books. But it is at least arguable that the life of the rural labourer five or six centuries ago had much to compensate for its hardship and squalor. If its pleasures would have little savour now, it is also true that its pains were less poignant than they appear to this less hardy generation.

R.H.R.

6.—*Land and labour: lessons from Belgium.* By B. Seebohm Rowntree. 633 pp. London: Macmillan and Co., Ltd., 1910. Price 10s. 6d. net.

At once statistical, economic, and political, Mr. Rowntree's exhaustive volume offers to the student a store house of opportune and illuminating facts. Some of these facts may have been already recorded and somewhere available, but they have not hitherto been brought together in such convenient juxtaposition, while the others, and they are many, which have been unearthed by this laborious enquiry, are here elaborately discussed in their comparative bearing on our own social economy. The form in which they appear testifies to a vast amount of painstaking research by the author. Such a work deserves and must receive the cordial acknowledgement of any enquirer into the problems which differentiate the agricultural and industrial life of a country like Belgium from that of neighbouring states, and from the conditions of Great Britain in particular. It is not necessary that one should entirely concur in all of the deductions made from the completed enquiry to see what really good work has been accomplished, and what valuable data are here presented, both for future reference and for economic argument in the perennial controversies which arise over such questions as those of small and large holdings, of masters and workmen, of landlords and tenants. Not a few sidelights on some of the immediately political or fiscal problems which are prominent in our day, on points of taxation or on the movement of land values are also suggested by an examination, such as these pages offer, of what the Belgian has to teach the Englishman by way of example or by way of warning. The cockpit of Europe as Belgium has been described in international warfare, its variously divided surface, and its mixture of Latin and Teutonic races, alike present a field for the study of conflicting theories, and leave us an impression of a drawn battle and an unsettled balance of economic doctrine. Mr. Rowntree is well entitled, after the long study he has made, to hold firmly to his own views as to the teaching which may be legitimately drawn from the disputed issues, even if we are not always convinced that the relative importance of the factors, which make up so complex a national problem, has been rightly weighed in every one of these pregnant pages.

The physical character and peculiarities of the Belgian territory, its land system, its industrial and agricultural growth are here successfully portrayed with a thoroughness which will ensure for Mr. Rowntree's labour the gratitude of economists and statisticians. The very varied races and very varied soil, and the close mixture of the industrial with the agricultural or at least the rural inhabitants, present at once a parallel and a contrast in the distribution of a densely-packed population on a relatively narrow surface, such as perhaps nowhere else in Europe can we so conveniently find.

From the statistical point of view a reviewer naturally fastens with interest on the results of Mr. Rowntree's estimates of the existing character of the land distribution of country which seems to give the status of landowner to 10 per cent. of the population, and indeed to 18 per cent. of the persons over 21 years of age. Evidence is furnished of the existence of well-nigh 720,000 owners on 6,895,000 acres, whereof only 27 owners can claim the dignity of holding a 5,000-acre estate. Three-fourths of the whole Belgian landowners possess less than 5 acres each, and 95 per cent. will be found to own less than 25 acres each. Over one quarter of the soil of Belgium is in the hands of owners under this 25-acre limit. Some idea of the trouble involved in reaching these figures is offered by Mr. Rowntree's explanation that the data relied upon are not the mere quotation of the official figures giving the superficial "number of landowners." That figure indeed shows nearly twice as many entries (1,302,737 in 1907) as have just been quoted. The larger figures are discovered to represent not separate proprietors but separate units of property in different communes, while it is found that some Belgians own land in 30, 40, or even 100 communes. Much closer investigations of the existing land registers were thus required to arrive at a closer estimate. These employed, we are told, the labour of something like 383 Government officials and 101 private clerks dealing with 300,000 record cards "weighing over $1\frac{1}{2}$ tons." To find the analysed result of all this search one must refer to the tables of the volume which throw much new light on the land diffusion which characterises Belgium. Yet with all this diffusion we are asked to remember that Belgium, though a country of small holdings, is not by any means a typical country of peasant proprietors. Only 28 per cent. of the holdings in number—representing however one-third part of the cultivated land—is actually "owner-farmed." On two-thirds of the agricultural surface it appears the system of tenant farming prevails. Even if, according to another calculation, of a more speculative character—where the survey is carried beyond the land properly cultivated, and common-land woods and forests are embraced, and the farming of the latter groups is somewhat tentatively attributed to the owners—the surface owner-farmed would scarcely reach one-half. Such facts lend importance to the information here collected of the very high rents prevailing in Belgium, and the intensive culture distinguishing certain regions. The author "averages" the rent of agricultural land in Belgium at 36s. 3d. per acre, against 20s. in England, and the value of the

soil—with, of course, enormous variations, which go far to discount the use of an “average” in such matters—at nearly 60*l.* per acre, against 25*l.* in this country. In dealing with the forcing up of land values in Belgium and the high rents which result from this keen demand for land, Mr. Rowntree urges that the State ought to claim a tribute from the unearned increment accruing to what he describes as mere “accidental owners.” Any discussion of the basis for this claim, and of the meaning of accidental ownership, would carry a mere reviewer perilously near embarking on some of the party political issues of the day nearer home. It is more to the purpose to call attention to the data here collected to show, so far as the Belgium official statistics may be implicitly followed—and there is room for some hesitation here as regards the earlier figures—the progress which agriculture, as a whole, has made in the last fifty years, and the relatively large proportion of the population which changing practice and more intensive cultivation has, here at all events, apparently succeeded in retaining on the soil. If even in Belgium there was 8 per cent. less of the cultivated land under cereals in 1895 than in 1846, it was mainly in wheat that any reduction occurred, and the areas under all crops for use by live stock were augmented. Wheat growing is quoted as falling off by 25½ per cent. in the fifty years, the surface under oats rising 23 per cent., and barley and rye remaining stationary. It is in the larger use of roots and of double or catch crops that the recent change of methods of farming is conspicuous. A claim is however made that better farming has vastly increased even the cereal produce, and, if we can accept the official reckonings at both dates as similarly arrived at, an acre of wheat now produces 18¼ cwts. against 12¼ cwts. in 1871-80 and 11 cwts. in 1846. Parallel advances are suggested in rye and oats. After all that has been said, however, of the spread of agricultural knowledge and the devotion of the Belgian peasant to closer forms of culture, it surprises one to note that Belgium has still but 64 per cent. of her land actually in cultivation. This is much the same ratio as France and Germany, and it is less than England and Wales can show (73 per cent.). Whether the definitions of “cultivation” in these countries are always identical is perhaps a matter of argument in these comparisons. The agricultural statistician may view with not a little interest the figures here quoted for the development of the live stock industry—other, of course, than sheep where the Belgians have lost heavily—and indeed the movement upwards in numbers of cattle and swine in Belgium is considerable. The increase in the cattle seems to date mainly since 1880, and there are questions of statistical enumeration to be considered which possibly may affect the figures. In any case the extent of the Belgian efforts here described to provide for its dense population will repay study, even if some of the not insignificant import figures quoted require a still further dissection, and may suggest a reference to and a comparison with other data, which have been forthcoming on the extent of the Belgian foreign food supply. If it were not ungenerous to suggest the extension of so vast an enquiry, one might have

welcomed some reference to the Belgian price records, which M. H. Denis has lately published.

An interesting section of Mr. Rowntree's work discusses the dimensions of the population actually engaged in Belgian agriculture. As elsewhere, and indeed as with ourselves, the official statistics on this point are difficult to handle, and leave a good deal of room for doubt. We are reminded that neither the 1,204,810 persons who have been regarded as "agricultural" in the agricultural census of 1895, nor the much smaller total of 697,372, which was credited to this industry by the general census of five years later, are to be taken as absolute facts. The larger figure seems to embrace many individual workers and their wives whose immediate work is really industrial, and whose concern with the small land plots they held was quite immaterial as a matter of income. The smaller figure again errs by defect in omitting to count exhaustively the whole of the female labour, which is inevitably involved by a small holding system of agriculture. However, even by the lower estimate some 15 per cent. of the Belgian population over 12 years of age would seem to be agricultural, and nearly a quarter of the "occupied" portion of the community might be assigned to this category. Mr. Rowntree indeed finds "on the land" 95 persons for each square mile in Belgium against 28 in Great Britain. A distinctive feature of difference, too, arises when we find it shown that 35 per cent. of the Belgian agricultural workers were labourers and 65 per cent. farmers or their families. These are proportions which it may be said are about exactly reversed in our own case in this country. The female working element in the Belgian agricultural group naturally rises high, as their type of agriculture imposes much labour on women. It is put here at 23 per cent. which, it will be remembered, is considerably above even the 19 per cent. credited to Scotland, and it contrasts forcibly with the mere 5 per cent. to which female labour, according to such records as we have, has been reduced in England and Wales. The growing industrialism of Belgium is nevertheless tending to restrict the proportion of the workers now reckoned as agricultural, although there is not, it would appear, any absolute decline, as with ourselves, in the numbers on a fifty years survey, but even an increase of some 11 per cent. The industrial element however was only 7 per cent. in 1846, whereas in 1896 it is put at 18 per cent.

How far the relative success of the small farm system with its intensive culture, high rents and high land values, has another side in the low pay, lower standard of living and hard grinding work of the Belgian peasant, and in his defective educational provision is a question which merits grave consideration. On the latter point we are told that nearly 20 per cent. of the population over 12 cannot read or write. These drawbacks are to be weighed when a contrast is made with British conditions and the higher wages and greater relative comfort of the agricultural labourer of our own country is not forgotten in this most useful contribution to a study of the Belgian life. The volume offers most abundant and elaborate information respecting the cost and modes of living and the

considerations governing the low Belgian wages. No reviewer would be justified, however, in attempting to exhaust the many spheres of enquiry here opened, such as the relatively large alcoholic consumption, which we are here told makes the Belgian workers toil for more than two months out of every twelve simply to pay their drink bill.

Emphatically, however, should the student be advised in his perusal of this book to turn to the weighty statistics given of the distinctive and most valuable aid which Belgium enjoys in the matter of internal transport over all her competitors. Not only does her intensely-developed mileage of ordinary railways put her well ahead of other States, but she possesses, in her remarkable system of light railways and cheap transport rates, facilities which perhaps have as much as anything to do with the profitable growth of intensive cultivation. The striking advantage of a light railway system—which, relatively to area, is nine times as extensive as in Germany, fourteen times as great as in France, and more than thirty-eight times as great as we can show in this country—is a very material addition to the growing knowledge and practice of scientific manuring, and the development of co-operative methods in largely helping the progress of the Belgian effort to make the most out of a soil which has no special advantages for the maintenance of a densely-packed population. P.G.C.

7.—*Histoire économique de la propriété, des salaires, des denrées et de tous les prix en général depuis l'an 1200 jusqu'en l'an 1800*. Par Le Vicomte G. d'Avenel. Tome v. Paris: Ernest Leroux, 1909.

This addition to the series of substantial volumes on the history of prices in France covers the same ground as the smaller volume, "Les Riches depuis sept cent ans," recently noticed in these columns (see *Journal of the Royal Statistical Society*, September, 1909). It is, therefore, unnecessary to survey the conclusions at which the author arrives. The present volume, in a wealth of footnotes and in a bulky appendix, supplies much of the material which has served as the basis of the statements in the text. The appendices, as in the preceding volumes of the series, give in detail the references to the original sources of information. Tables setting forth the estimated classification of French families, both according to the amount of their income and that of the property they possess, the latter based on the statistics of inheritances, are included, as well as extracts from ancient documents. A further table compares the grouping of families, in accordance with their wealth, in England and in France. The author criticises the views of Mr. Bernard Mallet laid before the Society in 1908, and contends that they result in an underestimate of British capital wealth. A.W.F.

8.—*La mortalità secondo l'età, e la durata della vita economicamente produttiva*. By G. Mortara. 84 pp., 8vo. Rome: Co-operativa Tipografica Manuzio, 1908.

The numerous collections which have been made lately of the life-tables of different countries materially facilitate the investigation of various interesting problems which have not hitherto been

treated otherwise than on the comparatively narrow basis of observations in a single country. In the work under notice, for instance, Dr. Mortara is able to start at once from the wide basis provided by the labours of not only his compatriots, who have long been in the van of this branch of statistics, but also of those working in the same field in most other countries of Western Europe. Our author goes even further abroad, and includes in his survey the tables for Japan, India, and more than one of the States of Australia. It is not apparent, however, that he materially strengthens his argument by the introduction of the facts relating to populations living under conditions of life so different from the circumstances affecting communities nearer home. Speaking generally, the author seeks to ascertain in the first instance, the relative effect on mortality of extrinsic influences, or the influence of external circumstances, and of intrinsic, by which he denotes the organic power of resistance, making use of tables prepared at considerable intervals of time for the same community, re-computed into the longer age-periods selected for his purpose. He then reviews the life-chances of the various populations from the standpoint of economic productivity. Here he groups his material, in accordance with precedent, into, first, the population under 15 years old, which he counts as costing more than it produces; secondly, from 15 to 20, during which, according to Pareto, the production is equal to consumption; from 20 to 60 the productivity exceeds the consumption, whilst over 60 the population again tends to be not self-supporting, though less burdensome than the young. In regard to this last category, it may perhaps be remarked, that there is likely to be a considerable difference between a population mainly agricultural and one which is more concerned in factorial industries, the former passing into the non-effective ranks later than the operative in the towns. Dr. Mortara discusses the effect upon the economic position of the population of a decline in the mortality, wisely beginning with the qualification "all other conditions being equal." He notes, for instance, the lower "cost of producing" an adult; the increased productivity of the adult due to an extension of the mean after-lifetime, and the greater number attaining and fulfilling the productive period, not to mention the less effort in obtaining these results under a smaller mortality. He examines the somewhat dogmatic conclusion of Lexis, that a decreased infantile mortality due to improvement in external circumstances tends to prolong life no more than a few years, and then amongst an enfeebled population; the conclusion being that this "compensation for over-production theory" is not established, though the evidence on each side is at present inadequate. In this view Dr. Mortara is in accord with several of his predecessors, and also as to the fact that an increased natality is not necessarily followed by an increased mortality in the community as a whole. Reverting to the earlier question, that of the influence of external conditions, the author considers his evidence to indicate that such influence is more prominent amongst children of over 5 than amongst the younger; that it tends to increase between 20 and 60, and to fall off as compared to the

gradual failing of resisting power in old age. There are, of course, several points in this work, referring to both method and conclusions, on which differences of opinion exist among experts, such as Ballod, Westergaard, and the author's own fellow-countrymen, Benini and Beneduce; but, in the main, the work is a useful and praiseworthy attempt to solve the difficult questions with which it deals. J.A.B.

9.—*The vagrancy problem: the case for measures of restraint for tramps, loafers, and unemployables; with a study of Continental detention colonies and labour houses.* By William Harbutt Dawson. xv + 270 pp., sm. 8vo. London: P. S. King and Son, 1910. Price 5s. net.

In the first three chapters of this book the author reproduces, with some supplementary information, three articles written by him in 1900, advocating detention colonies and labour houses and other methods of solving the problem of how to deal with the urban loafer. Even in these ten years, however, progress has been made in the direction of the measures then urged by him, by the establishment of public labour registries and by the prohibition of child vagrancy, under the Children's Act, 1908, which he rightly qualifies as a humane law. The new matter relates to (1) the Belgian beggars' dépôts; (2) the German labour houses and tramp prisons, with special reference to the Berlin municipal labour house; and (3) the treatment of vagrancy in Switzerland. Mr. Dawson points out that, prior to the enactment of the German Imperial Penal Code, poor-law authorities in several of the States constituting the German Empire had power to enforce labour on the "work-shy." The municipal labour house at Leipzig is for the detention, suitable employment, and moral improvement of that class, as well as of persons under 18 years of age who are demoralised, children under 15 who are in danger, homeless persons, persons condemned to simple detention with hard labour, and persons condemned to simple detention who, though not condemned also to hard labour, wish for employment. The Dresden labour house adds to these classes that of fathers of illegitimate children who neglect to provide for them. These provisions appear to go beyond anything that a British legislature would be likely to depute to poor-law authorities.

In a final chapter Mr. Dawson reviews the recommendations of the recent Royal Commission, the Viceregal Poor-law Reform Commission for Ireland, and the Departmental Committee on Vagrancy. He finds in them evidence that a new spirit has come over public opinion on these questions. His remarks are acute and judicious. Some useful appendices are added. E.B.

10.—*Royal Commission on the Poor Laws and Relief of Distress.* Appendix, vol. xixa. *Report on the effects of employment or assistance given to the "unemployed" since 1886 as a means of relieving distress outside the Poor Law in Scotland.* By the Rev. J. C. Pringle. xii + 193 pp., fol., and 18 plates. [Cd-5073.] 1910. Price 3s. 6d.

This report is preceded by a letter of transmissal, addressed to Lord George Hamilton, as Chairman of the Commission, containing

a modest apology by Mr. Pringle for the "very rough manner" in which his report has been brought together, and explaining the brief space of time available to him and the other difficulties he experienced in fulfilling his mission. The report itself is divided into four parts. In part 1 the evidence derivable from parliamentary and other reports, as to the recurrence of periods of distress which have led to unemployment, the predominant causes of it, and the means adopted for dealing with it, is summarised. In part 2 particulars as to the unemployed are given, and an answer is sought to several questions, among them—to what extent the unemployed are persons who are or have been members of friendly societies or trade unions. The answer is that the class applying for assistance has not the habit of making provision on mutual lines. From this Mr. Pringle draws some important inferences. In part 3 the agencies for dealing with or providing against unemployment (other than distress committees) are described. In part 4 the effects of assistance to the unemployed are discussed. The problems formulated in the official memorandum, defining the enquiry which Mr. Pringle and the investigators in other parts of the country were appointed to undertake, are dealt with in succession, and the evidence tending towards a solution of them is clearly stated. There are few, however, of those problems in which this evidence can be said to be absolutely conclusive. The appendix contains a great amount of statistical detail, but from the nature of the subject it does not afford much material for comparison, nor does it lend itself easily to broad generalisation. The great number of diagrams showing the fluctuations of unemployment in various occupations and localities illustrate this. All that need be added is an expression of admiration for the zeal and industry with which Mr. Pringle has accumulated so large a body of facts bearing on the question he was called upon to investigate.

E.B.

11.—*People's banks; a record of social and economic success.* By Henry W. Wolff. Third edition, newly revised and enlarged. xv + 587 pp., 8vo. London: King and Son, 1910. Price 6s. net.

The first edition of this useful book appeared in 1893, and was less than half the size of the present volume, which has nearly two hundred more pages than the second edition, dated 1896, but issued in 1897. All three bear the same dedication—to Sig. Luzzatti, the Prime Minister of Italy, and founder of people's banks there, and the same mottoes testify to that which has been Mr. Wolff's inspiring idea throughout, viz., Mr. Gladstone's statement that "if someone had told me a few years ago what progress co-operation was about to make, I should have said that he was talking of a vision of Utopia," and M. Jules Simon's aphorism that "the greatest banker of the world is he who deals with the pence of the proletariat." In other respects, revision and bringing up-to-date have come to mean re-writing, and new chapters have been added. Mr. Wolff may justly claim that his work is the most complete book on the subject published in any language. It is supplemented by a volume on the rationale of the principles and

practice of co-operative banking, which was reviewed in this Journal, vol. lxx, p. 353.

The added chapters appear to be those relating to adaptations, assisted co-operative credit, co-operative credit in Austria and Hungary, and co-operative credit in India. In that on adaptations, Mr. Wolff tells the story of off-shoots of the Schulze-Delitzsch system in Württemberg and Hanover, of a union of Polish societies, established in 1873, which in 1908 had 234 societies with outstanding advances exceeding 7,000,000*l.* sterling, and of a thoroughly people's bank organised in Lorraine; and he criticises with some severity the methods of the organisation in Germany of which Herr Haas is chairman. In the chapter on assisted co-operative credit, Mr. Wolff expresses views which are absolutely sound, and the more deserving of consideration that they come from so enthusiastic a worker and so doughty a combatant for the banks. There is no country, he says, where the seductive issue has not been raised, whether co-operative banks should not be helped in their first formation and their extension by a little judicious aid. In not a few countries, the solution has been sought in some form of State intervention. In Prussia, in 1895, a State-endowed central bank was created. It does not pay. In 1901, the Italian Government reversed M. Luzzatti's golden rule of providing security first and money after, and opened a fund to make loans to co-operative institutions to be created in the future. The hope that thus thrift would be stimulated has not been realised. Similar attempts have been made by ourselves in India, with the like result. The lesson of it all is that the State should confine itself to its proper business, and not think that it is promoting co-operation when it is merely distributing a mischievous kind of charity. In the chapter on co-operative credit in Austria and Hungary, Mr. Wolff presses the point further, and shows that the bureaucratic administration organised with State help by the late Count Károlyi has overridden the members' self-help and self-government. In the chapter on co-operative credit in India, Mr. Wolff observes that by poverty and opportunities for production, that great dependency appears to be specially marked out for the practise of co-operative credit. After reviewing the history of the movement and stating the present financial position of the 1,766 rural banks, the 225 urban banks, and the 14 central banks in India, he concludes that the seed of co-operation has fallen upon good ground, and that the institution of co-operative credit is a more efficient remedy for distress and backwardness than any that State tutelage or State financing could have produced.

Mr. Wolff may well be congratulated on the social and economic success that has attended the movement of which he has so long been the enthusiastic and untiring advocate, and be encouraged to continue his philanthropic labours by the reception with which his book has been met.

E.B.

12.—*Other New Publications.**

[These notes do not preclude a fuller review in a later issue of the Journal.]

Albert (Dr. Hermann). Die geschichtliche Entwicklung des Zinsfusses in Deutschland von 1895 bis 1908. 210 pp., 8vo. Leipzig: Duncker and Humblot, 1910. Price 5 marks 50 pf.

[A study of the rate of interest in Germany, and of its development in recent years. The book is divided into two parts, the first dealing with its theoretical development and the second with its historical development. There are several diagrams illustrative of the subject.]

Arctowski (Henryk). Studies on Climate and Crops. The Yield of Wheat in the United States and in Russia during 1891 to 1900. 16 pp., 8vo. New York, 1910.

[The author finds that the variations of harvests are such that bad years in one region of the globe are frequently years of excellent yield in another region, though the centres of compensation are not always in the same regions.]

Baghot (Walter). Lombard Street. A description of the Money Market. New edition, with an Introduction and Corrigenda by Hartley Withers. 372 pp., 8vo. London: Smith, Elder and Co., 1910. Price 3s. 6d.

[Mr. Withers, in bringing out a new edition of this classic, gives those who are unacquainted with the money market of to-day a brief account of the principal movements and tendencies which have altered the conditions of the market since Baghot wrote, and which he foresaw and predicted.]

Baker (C. Ashmore). Rates; being the Revenue and Expenditure of Boroughs and Urban District Councils of ten thousand or more inhabitants (England and Wales). Analysed and Compared. 33 pp., fol. London: P. S. King and Son, 1910. Price 2s. 6d. net.

[This compilation will be most useful to students of municipal trading, one of the difficulties of which is the selection of figures that are actually comparable. The basis of reference adopted has been the population of the towns at the census of 1901, except in the case of "public works," where the mileages of streets and roads maintained by the Councils have been taken as the divisors. It is hoped in future issues considerably to extend the scope of the book.]

Bertillon (Dr. Jacques). Statistique des successions en France et à l'étranger. 60 pp., 8vo. Paris: Berger-Levrault et Cie., 1910.

[Owing to recent improvements in the French official statistics of the values and numbers of estates passing by death, it is possible to obtain fuller information as to their distribution among different classes of the community than was heretofore the case. This interesting study seeks to utilise this information and to compare it with conditions in other countries in so far as comparison is possible.]

Cox-Sinclair (Edward S.) and Hynes (Thomas). Land Values. The taxation of land values under the Finance (1909-10) Act, 1910 . . . xxxii + 418 pp., 8vo. London: Charles Knight and Co., 1910. Price 10s. net.

[This book has been written in view of the scheme of land valuation and taxation under Part I of the Finance Act, 1910. It gives a short historical account of existing systems of taxation and valuation. Part 2 deals with valuation and taxation of land values, and Part 3 contains the text of the Act, with notes.]

* See also "Additions to the Library," page 807, *sqq.*

Dryden (John F.). Addresses and Papers on Life Insurances and other subjects by —, President of the Prudential Insurance Co. of America. 330 pp., 8vo. Newark, N.J.: The Prudential Insurance Company of America, 1909.

[An interesting collection of Papers dealing with industrial insurance and its growth in recent years.]

Edwards (Rev. George Z.). A Vicar as Vagrant, with introduction by Rev. Canon Denton Thompson, M.A., Rector of Birmingham. 32 pp., 8vo. London: P. S. King and Son, 1910. Price 2d.

[Describes experiences of common lodging houses and the surroundings of the vagrant class. The author advocates the formation of labour colonies in each county, which would lessen the necessity for the present casual wards.]

Gini (Prof. Corrado). Sulla variabilità dei due sessi alla nascita e nelle età adulte. 49 pp., 8vo. Cagliari: G. Dessi, 1910.

[A statistical study of the variability of sex at birth and of adults. There are tables of anthropometric measurements of infants at birth, distinguishing the sex, compiled at lying-in institutions in different countries.]

———. Intorno al metodo dei residui dello Stuart Mill e alle sue applicazioni alle scienze sociali. 22 pp., 8vo. Cagliari: G. Dessi, 1910.

Higgs (Mary) and Hayward (Edward E.). Where shall she live? The homelessness of the woman worker, written for the National Association for Women's Lodging Houses. viii + 216 pp., sm. 8vo. London: P. S. King and Son, 1910. Price 1s. 6d. net.

[Housing difficulties and dangers that beset the woman worker under present conditions in large towns.]

Jaffé (Edgar). Das englische Bankwesen. Zweite durchgesehene und erweiterte Auflage. xiii + 370 pp., 8vo. Leipzig: Duncker and Humblot, 1910. Price 7 marks 20 pf.

[This book should be of much value in Germany in helping its readers to an understanding of the English banking system. It is a second and enlarged edition of the book published in 1905. The first part deals with the Bank of England, and describes the various classes of London and provincial banks, and also London as the clearing house of the world. The second part deals with the organisation of credit, and the third part describes the inner organisation of banks and their methods of transacting business. A final chapter deals with the one reserve system and its reform, and there is an appendix of tables which are useful and pertinent to the subject under review.]

Schiavi (Alessandro). Il problema delle abitazioni e la produttività dei muratori (Primo contributo alle discussioni economiche nel "Museo Sociale" di Milano). 73 pp., 8vo. Torino, 1910.

[A study of the question of the influence of increase of wages and of the reduction in the hours of labour of those employed in the building trades on the cost of dwellings for the working classes. The inquiry deals with these conditions in England, the United States, Germany, and Italy.]

Supino (Camillo). Il mercato monetario internazionale. 363 pp., 8vo. Milan: Ulrico Hoepli, 1910. Price 6 lire.

[An exhaustive study on the international money market. The book is divided into fifteen chapters, dealing with the international circulation of the precious metals, foreign exchanges, the English and American money market, and other subjects pertinent to the inquiry.]

Fargha (Julius de). Hungary: A sketch of the country, its people and its conditions. 80 pp., 8vo. Budapest, 1910.

[A useful statement of the general conditions of Hungary, the value of which is increased by the inclusion of some of the latest statistics.]

Wylie (J.). The duties on land values and mineral rights under Part 1 of the Finance (1909-10) Act, 1910. xii + 265 pp., 8vo. London: Jordan and Sons, Ltd., 1910. Price 3s. 6d. net.

[The main object of this book is to give a general view of the new Finance Act, and of the duties imposed in their relation to each other.]

Austria. Das Getriede im Weltverkehr. Statistische Tabellen über Produktion, Handel, Konsum und Preise. Dritte Folge. La. 8vo. Vienna: Wilhelm Frick, 1909.

[A valuable compilation—the third of the series—of the statistics of the production, imports and exports, consumption, and prices of food grains in the principal countries of the world. The tables are well up to date, considering the number of countries with which they deal, and most of them give the statistics for a series of years.]

Bulgaria. Annuaire Statistique du Royaume de Bulgarie. Première Année 1909. La. 8vo. Sofia: Imprimerie de l'Etat, 1910.

[This first issue of a statistical year-book for Bulgaria will be welcomed by all who have occasion to consult the statistical returns of that kingdom. It has been the wish of the Statistical Bureau to issue a year-book for many years past, but there were many difficulties in the way, not the least of which was the scantiness of statistical information under many of the heads of information usually found in books of this nature. The present volume, however, demonstrates that these difficulties have been overcome.]

Birmingham. Health Department. Report on industrial employment of married women and infantile mortality. 27 pp., 8vo. Birmingham, 1910.

[This report is the result of an inquiry made in one of the districts of Birmingham where the industrial employment of women was greatest, and where there was also a high rate of infantile mortality. The object of the inquiry was to ascertain the effect of employment, both before and after child-birth, on the health of the mother and the child. The result of the inquiry shows that, within its limits, the infant mortality of the women industrially employed was rather *less* than the infant mortality of women not so employed.]

Tariff Reform League. Reports on Labour and Social Conditions of Germany. Vol. 1. Working Men's Tours. Nos. 1—3. 8vo. 1910. Price 1s. net.

CURRENT NOTES.

The King, who as Prince of Wales was Honorary President of the Royal Statistical Society, has been pleased to become Patron of the Society in succession to His late Majesty King Edward VII.

The supply of money in London has become abundant, and there has been some talk of a further reduction in the Bank of England Rate from its existing level of 3 per cent. In anticipation of such reduction the open market rate of discount fell to $1\frac{3}{4}$ per cent. The condition of the Bank of England warranted a reduction in the official *minimum*, as the stock of gold rose to 43,042,000*l.* and the reserve to 33,858,000*l.* But the ease in money brought a new factor into the situation. The American exchange has fallen to a point which permits of the export of gold from London to New York. The purchase of 750,000*l.* in gold on American account stiffened rates of discount and prevented the Bank of England from reducing its rate. The international monetary situation is an interesting one. In the past season the trade expansion was marked, the high prices of cotton, wool and other commodities enabled most of the food producing countries to import large amounts of gold, and the accumulation of gold in Russia, in Australia, in Argentina and in Brazil absorbed practically the whole of the additional supplies available for banking purposes. Indeed, the demand for gold for those countries was so great that London was compelled to draw upon New York. To meet the demand the United States in the twelve months to the end of May exported 25,000,000*l.* in gold. It imported about 8,000,000*l.* of gold from Canada and Mexico, but on balance its exports of gold reached 17,000,000*l.* The ability of other countries to obtain gold from the United States arose from the largeness of the imports of merchandise into that country and the relative smallness of the exports. Beyond exporting this gold, America borrowed permanent capital from Europe to the extent of 60,000,000*l.* The expansion of trade and the increase in bankers' loans in the States called for an increase in the gold reserves of the country rather than a diminution, and in recent months bankers have been compelled to restrict their loans and to put a brake upon the trade expansion in consequence of the smallness of their cash reserves. The situation at the moment is the reverse of that of the past year. Those countries which bought gold freely last year have not the power to take the metal this year, and the new supplies of gold are available for other countries that need it. At

the moment these countries are pre-eminently the United States and Germany. Now that the Bank of England has become strong and is no longer seeking to add to its reserves, the new arrivals of gold from the mines are being sent to Berlin and to New York. How much gold will be sent to New York cannot at the moment be determined. It looks as if the total would be large, as bankers, by checking the trade expansion in the States, have forced a diminution of imports and an expansion of exports. At the same time a good deal of European capital is flowing to America. Having regard to the dearth of demand for the markets that bought so freely last year, it is anticipated that no difficulty will be experienced in providing the United States with all the gold it needs. Estimates of the amount of gold that may be sent this autumn vary from 5,000,000*l.* to 10,000,000*l.*, but it is thought that the smaller amount will prevent monetary stringency in the States and will encourage trade. The appearance of the American demand for gold caused discount rates to recover, and at the time of writing the rate for three months' drafts is $2\frac{1}{16}$ per cent., and for six months' to $2\frac{3}{4}$ per cent.

The sensation in the Stock Exchange in the past month has been the renewed decline in the prices of American securities. The ostensible cause of the fall was the decision of the Interstate Commerce Commission to order reductions of rates to points in Nevada. Hitherto the practice of rate-making to interior points has been to charge the competitive rates to the Pacific coast *plus* the local rate for the return haul from the Pacific coast to interior points. Thus, the first-class rate from Omaha to Sacramento on the Pacific coast is \$3 per 100 lbs., but from Omaha to Reno, which is 154 miles shorter, the charge is \$4.29 per 100 lb., or nearly 40 per cent. greater. The State of Nevada asked for the same rates as Pacific coast points. The full extent of this demand was refused, but substantial reductions were ordered. Previously, the railway companies had sought to raise their rates in order to offset the effect upon their profits of the advance in the rate of wages, but had been prevented by injunction from the Government. It was understood, however, that the matter would be fully discussed later on, and that reasonable increases in freight rates would be accorded to compensate the railways for the increase in wages. Consequently the somewhat sweeping reductions in rates ordered by the Commission came as a surprise to the market, and prices of stocks fell heavily. Subsequently, it transpired that the reductions in rates were not of such a drastic character as at first reported, and that the whole question of Western rates is to be further discussed. Doubtless, the decline

in the prices of securities would not have been so great but for the knowledge that bankers' loans had become somewhat extended in relation to their reserves. The announcement that gold shipments had commenced to be made from London to New York had a steadying effect, and there has lately been a moderate recovery.

A good deal of attention has been paid to the condition of the crops of the United States. Alarming reports were received of the state of the spring wheat crop in Minnesota, North Dakota, and South Dakota, and the Governmental Crop Report indicates that in these States the wheat crop may be only about two-thirds of the amount reaped last year. Recently the crop reports have somewhat improved. The maize crop is estimated to be much greater than ever before, and to show an increase of nearly 25 per cent. in the yield compared with last year. The winter wheat crop is also a good one, and at the time of writing, plentiful rains are reported to have fallen in the spring wheat States and to have somewhat improved the outlook for this crop also. On the whole, the crops of the United States are likely to be quite up to the average. A matter of great importance to this country is the comparatively favourable condition of the cotton crop, a yield of something like 13,000,000 bales being looked for in comparison with only 10,500,000 bales in the current year.

Mr. Sauerbeck's index-number of prices for June is 76·9, the average of the eleven years 1867-77 being taken as 100. The drop from 78·2 last month marks a further decline. The index-number has gradually gone down since March, and the advance since December has nearly all been lost. Corn was rather cheaper, and animal food could not maintain the high May prices. Metals, textiles, hides, and tallow were rather weaker. Taking articles of food and materials separately, food is 74·5 as against 75·5 in May, while materials are 78·6 as against 80·2. Silver shows a slight rise.

The trade returns for June show a continuance of the progress recorded during the present year. Both imports and exports, as will be seen from the subjoined tables, show increased values. Among imports, the only class which shows an increase is that for raw materials and articles mainly unmanufactured. This has advanced by 3,873,557*l.* Among exports, articles wholly or mainly manufactured show an advance of 4,136,719*l.*, raw materials and articles mainly unmanufactured of 587,235*l.*, food, drink and tobacco of 304,359*l.*, and miscellaneous and unclassified articles of 53,366*l.*

Imports.	June, 1910.	Increase (+) or decrease (—) in June, 1910, as compared with June, 1909.
Imports, value c.i.f.—	£	£
I. Food, drink and tobacco	21,790,312	— 815,486
II. Raw materials and articles } mainly unmanufactured	19,726,912	+ 3,873,557
III. Articles wholly or mainly } manufactured	12,920,365	— 123,177
IV. Miscellaneous and unclassi- } fied (including parcel post)	199,169	— 10,010
Total merchandise.....	54,636,758	+ 2,924,884
Imports of bullion and specie	7,792,095	+ 1,790,722

Exports.	June, 1910.	Increase (+) or decrease (—) in June, 1910, compared with June, 1909.
Exports of produce and manu- factures of the United Kingdom, value f.o.b.—	£	£
I. Food, drink and tobacco	2,117,579	+ 304,359
II. Raw materials and articles } mainly unmanufactured	4,774,895	+ 587,235
III. Articles wholly or mainly } manufactured	27,333,944	+ 4,136,719
IV. Miscellaneous and unclassi- } fied (including parcel post)	573,236	+ 53,366
Exports of foreign and colonial merchandise, value f.o.b.—		
I. Food, drink and tobacco	1,093,456	+ 135,530
II. Raw materials and articles } mainly unmanufactured	4,553,048	— 342,545
III. Articles wholly or mainly } manufactured	2,726,379	+ 625,820
IV. Miscellaneous and unclassi- } fied (including parcel post)	10,760	— 767
Total, British, foreign and colonial	43,183,297	+ 5,499,717
Exports of bullion and specie	2,546,453	— 397,132

Shipping (foreign trade).	June, 1910.	Increase (+) in June, 1910, compared with June, 1909.
	Tons.	Tons.
Total, British and foreign, <i>entered</i> } with cargoes	3,817,020	+ 49,593
Total, British and foreign, <i>cleared</i> } with cargoes	5,157,668	+ 211,383

The Returns of Births and Deaths of the Registrars-General of England, Scotland, and Ireland respectively during the four weeks ending June 25, 1910, show the following results:—

	Estimated population.	Births and deaths registered.		Mean Birth-rates.	Mean Death-rates from all causes.
		Births.	Deaths.		
England and Wales (77 great towns).....	16,940,895	33,975	14,778	26·14	11·37
Scotland (8 principal towns).....	1,891,936	3,764	2,018	25·9	13·9
Ireland (Dublin registration area and 21 urban districts)	1,151,790	2,636	1,604	29·8	18·2

Apart from an abrupt fall in the Irish birth-rate during the week ending June 25, from 31·8 to 24·4, the above rates show no very remarkable change.

The following returns relating to pauperism, from data supplied by the Local Government Board, in England, Scotland and Ireland, are extracted from the Board of Trade *Labour Gazette* for June, 1910:—

Selected urban districts.	Paupers on one day in the second week of May, 1910.				Decrease (—) in rate per 10,000 of population on a	
	In-door.	Out-door.	Total.	Rate per 10,000 of estimated population.	Month ago.	Year ago.
England and Wales—						
Metropolis	78,303	42,427	120,730	251	— 5	— 3
West Ham	5,080	11,523	16,603	21½	....	— 2
Other districts	71,606	120,669	192,275	20½	— 3	— 7
Scotland	10,820	34,804	45,624	21½	— 3	— 3
Ireland	15,133	12,477	27,610	24½	— 2	— 1
Total, May, } 1910	180,942	221,900	402,842	221	— 3	— 5

According to the Board of Trade *Labour Gazette*, the state of the labour market in May was as follows:—

	Trade Unions making returns.		Reported as unemployed.	
	Number.	Net membership.	Number.	Percentage.
May, 1910.....	416	703,439	29,787	4·2
April, 1910	416	699,932	30,475	4·4
May, 1909	416	699,779	35,473	7·9

Employment in May continued to improve on the whole. There was a slight decline in the printing and furnishing trades, and an improvement in most branches of the metal, engineering, and shipbuilding trades. In the other industries employment was much about the same as in April.

Mr. John Burns, the President of the Local Government Board, in moving the second reading of the Census (Great Britain) Bill in the House of Commons on June 14, referred to the improvements introduced into the Bill on the recommendation of the Royal Statistical Society and the Society of Medical Officers of Health, especially in regard to duration of marriage and the number of rooms occupied. Mr. Burns stated that the preliminary report would be ready sooner than it was on the occasion of the last census, and at as early a date as practicable without setting any limit of three or five months. The Registrar-General hoped the preliminary report would be out in less than three months after the census was taken, while he was optimistic enough to believe that the main report might be considerably earlier than usual if the Treasury sanctioned the use of certain mechanical apparatus for tabulation and counting. With reference to a quinquennial census, he had hoped that such an enumeration might be provided for in the present Bill, but the Treasury were not prepared to sanction such a step. There would, however, be time to press the matter again before the quinquennial period came round. A quinquennial census would cost between 100,000*l.* and 185,000*l.* Mr. Burns then proceeded to explain the changes in the schedule and the enumerators' districts.

In the debate which followed, Sir Charles Dilke urged the necessity of a quinquennial enumeration and of a permanent Census Office. He referred to the recommendations of the Census Committee of the Royal Statistical Society, which would no doubt be carried out so far as possible within the limits of the Bill. Mr. Walter Long, in supporting Sir Charles Dilke, pointed out that the census might be held quinquennially without an additional cost of 100,000*l.* Mr. Boland suggested that a column should be added showing the extent to which the Welsh, the Erse, and the Gaelic tongues were spoken in Great Britain. Mr. Ormsby-Gore advocated the insertion of a religious profession column in the schedule. Mr. Llewelyn Williams protested strongly against the suggestion of a religious census. Mr. Carlisle urged the insertion of a new column dealing with employment. Mr. Kettle and Captain Cooper pointed out that there was no difficulty in taking

a religious census in Ireland. The Bill was read a second time, and committed to a Committee of the whole House.

The House went into Committee on the Bill on June 21. On Clause 1, which provides for taking the census for Great Britain in 1911, Sir F. Banbury moved to omit "Great Britain" and insert "England and Wales," his object being to obtain a separate Bill for Scotland. Previous to 1900 it had always been the practice to deal with the three countries by means of separate Bills. Sir H. Craik seconded the amendment. Mr. Burns, in opposing the amendment, stated that the Scotch Office were quite content with the present Bill. The Lord Advocate (Mr. Ure) said there was no objection to Scotland having a separate census, but there was no necessity for a separate Bill. In 1901, when it had been found possible to make provision for Scotland in the Bill dealing with England, the census was ordinarily taken and a separate report was published. After further debate the amendment was lost by 131 to 206. Mr. Fell's amendment to substitute May 28 for April 2 as the date of the census was negatived. On Clause 4 (Preparation and filling up of schedules), Mr. Goldman's amendment, to include in the particulars to be given the amount of earnings from all sources in the previous week of every person under eighteen years of age, was negatived. Mr. J. Parker moved an amendment providing that, in addition to the name, sex, age and occupation, particulars should be furnished showing "whether unemployed or retired, and, if the former, how long during the previous twelve months." Mr. Lees Smith moved to amend the amendment by limiting it to the supplying of information "for how many days during the previous week" the person had been unemployed. The amendment was withdrawn in favour of the amendment to the amendment, which was, however, negatived. Mr. Rawlinson moved to insert after "occupation" the words "religious profession." In the debate which followed, Lord Hugh Cecil and Sir A. Cripps, among others, took part. Mr. John Burns having replied, the amendment was lost by 38 to 135. Mr. Rawlinson then moved the omission of paragraph (c), which referred to married persons, the duration of the marriage, and the number of children born of the marriage. After a warm debate the amendment was lost by 61 to 151. An amendment by Mr. Fell, to insert the words "or marriages" after marriage, was lost by 65 to 145.

In the House of Lords the second reading of the Bill was moved by Lord Beauchamp on July 7. In the debate which followed, Lord Newton criticised the Government for omitting to provide for

a religious census. The Bishop of St. Asaph and Lord Sheffield also spoke. The House went into Committee on the Bill on July 12, when Lord Newton moved an amendment providing for the insertion of a column for the statement of religious profession. The Bishop of St. Asaph, Lord Beauchamp, Lord Sheffield, and Lord Crewe spoke against the amendment, which was supported by the Bishop of St. David's, Lord Lansdowne, Lord Braye, and the Archbishop of Canterbury. On a division, the amendment was carried by 38 to 31. Another amendment, moved by Lord Newton, to insert a provision "that no person shall be subject to any such penalty for refusing to state his religious profession," was agreed to. The Bill, as amended, was reported to the House. On the report stage, on July 19, Lord Eversley moved to amend clause 4 (preparation and filling up of schedule) by omitting the words "religious profession." Lord Newton opposed this amendment, being supported by Lord Lansdowne, Lord Camperdown, and the Bishop of St. David's. Lord James of Hereford and Lord Beauchamp supported the Government. On a division Lord Eversley's amendment was lost by 29 to 32.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

The Accountant, 1910—

June 11—Finance (1909-10) Act, 1910.

June 18—The checking of coal royalty accounts: *Bartlett (R. Wilson)*.

June 25—Company liquidations in Scotland: *Gowans (John Stuart)*.

July 2—The Institute of Municipal Treasurers and Accountants (Incorporated).

Accountants' Magazine, July, 1910—The report of the Departmental Committee on Scottish bankruptcy law: *Fleming (W. A.)*. Some notes on the recent depreciation of gilt-edged securities: *Fogo (J. Row)*.

Bankers' Magazine. July, 1910—Banking now and forty years since. The Argentine centenary.

Economic Journal. June, 1910—Meeting of the Royal Economic Society: *Haldane (Rt. Hon. R. B.)*. Economics of imperialism: *Nicholson (Prof. J. S.)*. Compulsory insurance against unemployment: *Gibbon (I. G.)*. Historical basis of English poor-law policy: *Bosanquet (Helen)*. Transference of the worsted industry from Norfolk to the West Riding: *Clapham (J. H.)*. German bank commission, 1908-09: *Lexis (Prof. W.)*. Reforms in the currency of China: *Un Yuen Hsu*. Applications of probabilities to Economics: *Edgeworth (Prof. F. Y.)*. New Old-age Pensions Act in France: *Bellom (Maurice)*. South Wales coal trade: *Jones (T. I. Mardy)*.

Financial Review of Reviews. July, 1910—Income tax and savings: *Fry (T. Hallett)*. Tenancy, ownership, and a national land bank: *Parker (Sir Gilbert)*. Geographical distribution of capital versus insurance: *Crozier (Dr. J. Beattie)*.

Journal of the Board of Agriculture. June, 1910—Baby beef: *Mackenzie (K. J. J.)*. The financial aspect of the growth of Scots pine: *Maw (Percival T.)*. Forestry in Hesse and some other German States.

Journal of the Institute of Actuaries. July, 1910—Some notes on the establishment of the office of Public Trustee in England: *Sharman (William C.)*. On the valuation of the payment on the death of a pensioner of the excess of his contributions, with or without interest, over his pension payments: *Tinner (Thomas)*. On a method of scheduling particulars for the valuation, in certain cases, of prospective pensions, based on terminal salaries: *Tinner (Thomas)*.

United Empire: The Royal Colonial Institute Journal. July, 1910—Thoughts on imperial defence: *Wilkinson (Prof. Spenser)*. Some practical steps towards an imperial constitution: *Amery (L. S.)*. The emigration conference.

UNITED STATES—

American Economic Association. Quarterly. April, 1910—Observation in economics. Presidential address: *Dewey (Davis R.)*. The phenomena of economic dynamics: *Pantaleoni (M.)*. Outlines of a theory of wages: *Tuussig (F. W.)*. Round table on the problems of country life. Valuation of public service corporations: *Williams (W. H.)*. Official valuations of private property: *Whitridge (F. W.)*. An argument against an official valuation of railroad properties: *Cotton (J. P.)*. The causes of trusts and some remedies for them: *Walker (Francis)*. The Sherman anti-trust Act: *Morawetz (Victor)*. The progress of taxation during the past twenty-five years, and present tendencies: *Seligman (E. R. A.)*. The assessment of property for taxation: *Purdy (Lawson)*.

Annals of the American Academy of Political and Social Science. May, 1910—The scope and functions of the stock market: *Huebner (S. S.)*. The purchase or sale of securities through a stockbroker: *Norton (Eliot)*. Stocks and their features—division and classification: *Adams (John)*. Preferred stocks as investments: *Moody (John)*. The declaration and yield of stockholders' rights: *Burgunder (B. B.)*. Convertible bonds and stocks: *Rollins (M.)*. Barometric indices of the condition of trade: *Babson (Roger W.)*. The sources of market news: *Babson (Roger W.)*. Influences affecting security prices and values: *Gibson (Thomas)*. Economic crises and stock security values: *Selwyn-Brown (A.)*. Railroad stocks as investments: *Snyder (Carl)*. Electric railway stocks: *Cunningham (Wallace McCook)*. Industrial stocks as investments: *Meyer (Edgar J.)*. Stocks of financial institutions: *Norton (L. A.)*. The wrongs and opportunities in mining investments: *Nicholas (Francis C.)*. Bibliography on securities and stock exchanges: *Huebner (S. S.)*. *Bankers' Magazine (New York). June, 1910*—Banking and subsidies: *Seijas (Simeon)*. The United States Treasury. VI: *Smith (William H.)*. South American trade opportunities: *Walsh (George E.)*.

Bulletin of the Bureau of Labor. No. 85. 1909—

November—Review of labor legislation of 1908 and 1909: *Clark (L. D.)*. Laws of various States relating to labor enacted since January 1, 1908. Cumulative index of labor laws and decisions relating thereto.

January, 1910—Canadian Industrial Disputes Investigation Act of 1907: *Clark (Victor S.)*. Phosphorus poisoning in the match industry of the United States: *Andrews (John B.)*. List of industrial poisons, prepared for the International Association for Labor Legislation: *Sommerfeld (Dr. Th.)*. International Association for Labor Legislation and its publications. British Trade Boards Act, 1909.

Journal of Political Economy. June, 1910—Symposium on the teaching of elementary economics: *Carver (T. N.)*. The Manchester Ship Canal: *Moulton (H. G.)*. The Illinois Ten-hour Law: *Breckinridge (S. P.)*.

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AUSTRIA—

Statistische Monatschrift. May, 1910—Statistische Grundlagen zur Beurteilung des Wohnungswesens in Österreich: *Palla (Dr. Edmund)*. Der Verkehr der Liegenschaften in Wien im Jahre 1909: *Engelhardt (Adolf R.)*. Neuere Literatur über den Wohnungsmarkt: *Delannoy (Dr. René)*.

FRANCE—

Bulletin de Statistique, Ministère des Finances, 1910—

April—Le budget de 1910. Loi portant fixation du budget général des dépenses et des recettes de l'exercice 1910. Les indices économiques. Les recettes des théâtres et spectacles de Paris. Belgique—Evaluation de la fortune mobilière.

May—Loi sur les retraites ouvrières et paysannes. Les contributions directes et taxes assimilées en 1909. Les monnaies fabriquées à la Monnaie de Paris et la circulation monétaire en 1909. Le budget de la ville de Paris pour 1910.

Journal des Economistes. June, 1910—La séparation du capital et du travail dans la production: *Molinari (G. de)*. Les transports par voie d'eau et par voie de fer: *Guyot (Yves)*. Le libre-échange comme puissance universelle: *Baskett (B. G. M.)*. Un coup d'œil sur nos finances départementales et communales (Suite et fin): *Goy (Louis de)*. Revue de l'Académie des sciences morales et politiques: *Lefort (J.)*. Travaux des chambres de commerce: *Rouxel (—)*. En Australie, le parti du travail et les finances publiques: *d'Aunet (Biard)*. Mouvement scientifique et industriel: *Bellet (D.)*. Lettre des Etats-Unis: *Tricoche (Nestler)*. Le placement des capitaux français en valeurs américaines: *Guyot (Yves)*.

La Réforme Sociale. June 16, 1910—La protection légale des travailleurs: *Clément (Henry)*. Dépopulation: *Worms de Romilly (P.)*. La situation morale aux Etats-Unis et la lutte antialcoolique: *Skarzynski (Louis)*. L'industrie chimique en Allemagne, les usines Bayer et Cie., leur organisation technique et sociale: *d'Assignies (J.)*. Chronique du mouvement social. Allemagne et Autriche-Hongrie: *Blondel (G.)*.

Revue d'Économie Politique. June, 1910—La révolution monétaire du xvi^e siècle: *Levasseur (E.)*. L'assistance à Genève: *Achard (A.)*. La liberté du commerce des grains et le Parlement de Paris: *Lescure (Jean)*. Chronique législative.

GERMANY—

Archiv für Sozialwissenschaft und Sozialpolitik. Heft 3. 1910.— Die Kommerzialisierung des Wirtschaftslebens: *Sombart (Werner)*. Die Soziallehren der christlichen Kirchen. III Hauptteil: Der Protestantismus: *Troeltsch (Prof. D. Ernst)*. Das Gesetz des abnehmenden Bodenertrages im landwirtschaftlichen Betriebe. II: *Esslen (Prof. Joseph)*. Einige Anmerkungen zur Lehre vom Standort der Industrien: *Sombart (Werner)*. Eine geometrische Fundierung der Lehre vom Standort der Industrien: *Bortkiewicz (Prof. L.)*. Die mechanisch-mathematische Analogie in der Volkswirtschaftslehre: *Spann (Prof. Othmar)*. Nochmals: Marx oder Kant: *Schulze-Gaevernitz (Prof. G.)*. Die Unternehmerorganisationen: *Lederer (Dr. Emil)*.

Jahrbücher für Nationalökonomie und Statistik (Conrad's). June, 1910—Die Reichsversicherungsordnung: *Wagner (M.)*. Die ungarische Volkszählung am Ende des Jahres 1910: *Vizaknai (Anton)*. Die wirtschaftliche Gesetzgebung des Deutschen Reiches im Jahre 1909. Die Streikbewegung in Österreich, Frankreich und Grossbritannien im Jahre 1908: *Meyer (Maximilian)*. Die internationale Automobilindustrie: *Kreuzkam*. Zum Stadtbegriff und zur Städtestatistik Russlands: *Sodoffsky (Gustav)*. Die Beschäftigung jugendlicher Arbeiter in den Niederlanden: *Ort (Jan)*.

Zeitschrift für Socialwissenschaft, 1910. Heft 6—Listenwahl und Einzelwahl: *Hasbach (W.)*. Beiträge zur Theorie des Kapitalzinses. VI: *Oswalt (H.)*. Politik und Nationalökonomie. V: *Pohle (L.)*. Die Verwaltung der Freien Gewerkschaften in Deutschland. III: *Schildbach (Bernhard)*. Arbeiterstreiks in Russland: *Notzel (K.)*.

Zeitschrift für die gesamte Versicherungs-Wissenschaft. July, 1910—Die Reichsversicherungsordnung als Reichstagsvorlage: *Stier-Somlo (Dr.)*. Der preussische Gesetzentwurf betreffend die öffentlichen Feuerversicherungsanstalten: *Docheritz (Knebel)*. Die neuen Versicherungsbedingungen. III. Haftpflichtversicherung: *Hagen*. Zeit- und Streitfragen der Sterblichkeitsmessung: *Altenburger*. Der Einfluss des Krieges auf Versicherungsverträge: *Wohberg*. Die Mietvorschuss-Versicherung: *Unger*.

SWITZERLAND—

Journal de Statistique Suisse, 1910. *Lieferung* 3—Statistique fédérale des poursuites pour 1903. Statistique des hôpitaux et hospices de la Suisse au 31 décembre 1909. Résultats de l'examen des aptitudes physiques des recrues en automne 1908. Durchschnittliche jährliche Sterblichkeitsziffer 1902 bis 1906 im ganzen und infolge tuberkulöser und carcinomatöser Erkrankungen. Légitimation d'enfants naturels en Suisse pendant l'année 1908.

INTERNATIONAL.—

Bulletin de l'Institut International de Statistique. Tome 18. 1910—
Livraison 1—Les crises économiques: *Lexis (W.)*. La méthode monographique et ses variantes: *De Forille*. Les classes sociales: *Fahlbeck*. La Statistique et les sciences de la vie: *Warweiler*. De l'aide que le calcul des probabilités peut prêter à la statistique: *Edgeworth*. Application des procédés mathématiques à la comparaison des statistiques: *March*. Application de la méthode de corrélation aux problèmes de statistique sociale et économique: *Yule*. Comparaison internationale des salaires, à l'aide de la médiane: *Bowley*. Sur l'emploi de la méthode différentielle pour la comparaison des statistiques: *Borel*. L'application du calcul des variations à certaines questions de statistique: *Perozzo*. Rapport sur la statistique de la tuberculose: *Lexis*. Mariages et divorces aux Etats-Unis: *Willcox*. Rapport au nom du Comité spécial pour l'étude de la fécondité des mariages: *Nicolai*. Distribution des sexes parmi les enfants consécutifs d'une même mère: *March*. Mortalité des nourrissons en France: *Huber*. Le recensement des villes de Tokio et Kobe: *Yanagisawa*. La dette hypothécaire et les charges publiques des immeubles en Hongrie: *Fellner*. Rapport sur la statistique internationale des pêcheries: *Rew*. Statistique internationale des finances: *Zahn*. Étude sur le développement et la répartition du revenu national au Japon: *Takano*. Annuaire statistique international des grandes villes: *Thirring*. La statistique internationale de l'assistance hospitalière: *Rasari*. L'enquête de l'Institut Solvay sur l'alimentation de la classe ouvrière en Belgique: *Warweiler*. Rapport sur le projet d'un vocabulaire des termes de l'économie politique et de la statistique: *Mandello et Oltet*. Fondation d'un office international de statistique: *Borghst (Van der)*. Les agglomérations urbaines en Russie: *Zolotareff*. La mortalité des nourrissons en Russie: *Zolotareff*. Production et prix des céréales en Russie: *Zolotareff*. Les accidents du travail en Russie: *Zolotareff*. La statistique criminelle dans les Pays-Bas: *Methorst*. Les classes sociales en Russie: *Zolotareff*. On the applications of the calculus of probabilities to statistics: *Edgeworth*. The applications of the method of correlation to social and economic statistics: *Yule*. A suggestion for the international comparison of wages by the use of the median: *Bowley*. Bericht über die Statistik der Tuberkulose: *Lexis*. Internationale Finanzstatistik: *Zahn*. Fondation d'un office international de statistique: *Borghst (Van der)*. An inquiry into the development and distribution of the national income in Japan based upon the income-tax statistics: *Takano*. Statistics of marriage and divorce in the United States: *Willcox*. International fishery statistics: *Rew*.

INTERNATIONAL—Contd.

Bulletin de l'Institut International de Statistique. Tome 18—Contd.

Livraison 2—La répartition de la race humaine sur le globe terrestre: *Levasseur*. Mortalité des nourrissons dans les Pays-Bas: *Methorst (W.)*. De la mesure des agglomérations urbaines: *Meuriot (P.)*. Rapport sur le dénombrement des aveugles à l'aide des recensements généraux de population: *Juraschek (F. von)*. Statistique des prix des grains: *Földes (B.)*. Le prix du blé dans divers pays au xix^e siècle: *Levasseur (E.)*. Répartition sociale des revenus: *Kiaer (N.)*. Statistique des transports internationaux: *Wendrich (A. de)*. Rapport présenté au nom de la commission des primes à l'agriculture, à l'industrie, au commerce à la navigation: *Raffulovich (A.)*. Les banques d'émission et de dépôt: *Lévy (R. G.)*. Statistique internationale des valeurs mobilières viii^e rapport: *Neymarck (A.)*. Statistique comparée de l'alcoolisme et de tuberculose: *Bertillon (J.)*. Statistique internationale des successions: *Bertillon (J.)*. La statistique hypothécaire: *Faure (F.)*. Rapport sur la statistique internationale des accidents du travail: *Cheysson (E.) et Fuster (E.)*. Les récents progrès de la statistique criminelle belge: *Lannoy (C. de)*. Les réformes de la statistique criminelle en France: *Tissier*. Répertoire technologique des industries et professions: *March (L.)*. L'Union statistique des villes italiennes: *Giusti (U.)*. Statistique de la presse périodique: *Juraschek (F. von)*. Notes sur la grande et la petite propriété en Espagne: *Barthe (A. Barthe Y.)*. Du rôle de la statistique dans l'enseignement scolaire: *de Tornauw*. Bericht über die Zählung der Blinden bei den allemeinen Volkszählungen: *Juraschek (F. von)*. Die Statistik der periodischen Presse: *Juraschek (F. von)*.

MONTHLY LIST OF ADDITIONS TO THE LIBRARY.

During the four weeks ended July 7, 1910, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they are acknowledged in a separate list contained in this *Journal*.

(a) Foreign Countries.

Argentine Republic—

Agricultural and Pastoral Census of the Nation. Stock - breeding and agriculture in 1908. Vol. i. Stock-breeding. Vol. ii. Agriculture. Vol. iii. Monographs. 3 vols., la. 8vo., cartograms, &c. 1909. (The Census Committee.)

Austria—

Das Getriede im Weltverkehr. Statistische Tabellen über Produktion, Handel, Konsum und Preise. Dritte Folge. La. 8vo. 1909. (The Austrian Government.)

[Another copy sent by the publisher, M. Wilhelm Frick, Vienna.]

France—

Statistique internationale du mouvement de la population . . . 1905. 8vo. 1907. (Dr. J. S. Keltie.)

Germany—

Berlin. Tabellen über die Bevölkerungsvorgänge Berlins im Jahre 1908. 4to. 1910. (The Municipal Statistical Bureau.)

Deutscher Verein für Versicherungs-Wissenschaft. Sammlung von Versicherungsbedingungen Deutscher Versicherungsanstalten. Teil 4. Unfall- und Haftpflicht-Versicherung. 8vo. 1910. (The Association.)

Hungary—

Census. Dénombrement de la Population des Pays de la Sainte Couronne Hongroise en 1900. Dixième Partie, Résumé des Résultats avec 24 Cartes Graphiques. 8vo. 1909. (The Central Statistical Office.)

Hungary: A Sketch of the Country, its People, and its Conditions. By Julius de Vargha. Third edition. 8vo. 1910. (*Id.*)

Italy—

Finance. Risultati finali della statistica del debito ipotecario fruttifero italiano al 31 Dec. 1903. Fol. 1909. (Dr. J. S. Keltie.)

— Statistica del debito ipotecario fruttifero esistente al 31 Dec. 1903. Fol. 1906. (*Id.*)

Netherlands—

Statistique des Impôts et autres revenus du Royaume pour 1908. 4to. 1910. (The Central Statistical Bureau.)

Norway—

Social Insurance. Forslag til valg av beregningsgrundlag for Riksforsikringsanstaltens varige invaliderenter. La. 8vo. 1910. (The Bureau of State Assurance.)

— Statistique des assurances contre les accidents des marins pêcheurs pour 1909. 8vo. 1910. (*Id.*)

(a) Foreign Countries—Contd.

Spain—

Memoria sobre el estado de la renta de aduanas en 1909. 8vo. 1910. (The Director-General of Customs.)

Switzerland—

Census. Résultats du recensement fédéral des entreprises agricoles, industrielles et commerciales du 9 août 1905. Volume 2. 1^e Partie. Agriculture. 2^e Partie. Sylviculture. 3^e Partie. Mines et carrières, chasse et pêche. 4to. 1910. (The Federal Statistical Bureau.)

United States—

Wyoming. Census of Wyoming, 1905. 14 pp., 8vo. 1905. (Dr. J. S. Keltie.) Carnegie Foundation for Advancement of Teaching. Standard Forms for Financial Reports of Colleges, Universities, and Technical Schools. Bulletin No. 3. June, 1910. 8vo. 1910. (The Foundation.)

(b) India and Colonies.

India, British—

Bhopal State Gazetteer. Vol. 3. Text and Tables. 8vo. 1908. (The India Office.)
 Burma Gazetteer. Northern Arakan District (or Arakan Hill Tracts). Vol. A. Salween District. Vol. A. 2 vols. 8vo. 1910. (*Id.*)
 Eastern States (Bundelkhand) Gazetteer. Vol. 6A. Text. Vol. 6B. Tables. 2 vols. 8vo. 1907. (*Id.*)
 Gwalior State Gazetteer. Vol. 1. Text and Tables. Vol. 1, Part 2. Atlas. Vol. 1, Part 3. Village List. Vol. 1, Part 4. Photos of places of historical interest. 4 vols. 8vo. 1908. (*Id.*)
 Indore State Gazetteer. Vol. 2. Text and Tables. 8vo. 1908. (*Id.*)
 N. W. Frontier Province. District Gazetteers. Vol. 3B. Kohat District. Statistical Tables. 1904. 8vo. 1909. (*Id.*)
 Punjab District Gazetteers. Vol. 22B. Chamba State. Statistical Tables, 1904. Vol. 29B. Attock District. Statistical Tables, 1907. 2 vols. 8vo. 1909. (*Id.*)
 Rewah State Gazetteer. Vol. 4. Text and Tables. 8vo. 1907. (*Id.*)
 United Provinces of Agra and Oudh. District Gazetteers. Vol. 8. Saharanpur. 8vo. 1909. (*Id.*)
 Western States (Mālwa) Gazetteer. Vol. 5, Part A. Text. Vol. 5, Part B. Tables. 2 vols. 8vo. 1908. (*Id.*)

British South Africa—

Transvaal—

Report of the Bewaarplaatsen Commission, 1909. Fol. 1910. (The Transvaal Government.)
 Report of the Power Companies Commission, 1909. Fol. 1910. (*Id.*)
 Mines Department. Report on the Manufacture of Iron and Steel in the Transvaal. By F. W. Harbord. 18 pp., 8vo. 1910. (*Id.*)

(c) United Kingdom and its several Divisions.

United Kingdom—

Earnings and Hours Enquiry. Report by the Board of Trade on Earnings and Hours of Labour of workpeople of United Kingdom. IV. Public Utility Services (Roads and Sanitation, Gas, Electricity, Water, Tramways, and Omnibuses) in 1906. [Cd-5196.] 1910. (The Board of Trade.)
 Army. Statistics relating to Special Reserve and Territorial Force. [Cd-5018.] 1910. (Purchased.)
 Distressed Colonial and Indian Subjects. Report of Committee and Minutes of Evidence and Appendices. [Cd-5133 and Cd-5134.] 1910. (*Id.*)

(c) **United Kingdom and its several Divisions—Contd.****United Kingdom—Contd.**

- Electoral Systems. Report of Royal Commission appointed to enquire into Electoral Systems, with appendices. [Cd-5163.] 1910. (*Id.*)
- Finance (1909-10) Act, 1910. (Increment Value Duty.) Regulations made by Commissioners of Inland Revenue under Sec. 4 of the Finance (1909-10) Act, 1910. (141.) 1910. (*Id.*)
- Japan. Proposed new Customs Tariff. Copy of draft Customs Tariff Law for Japan with Tariff of Import Duties. [Cd-5150.] 1910. (*Id.*)
- Port of London Act, 1908. Report by Right Hon. Viscount St. Aldwyn of Inquiry held by him with respect to schedule of Maximum Port Rates on Goods submitted to Board of Trade by the Port of London Authority and draft provisional Order embodying the Schedule. [Cd-5156.] 1910. (*Id.*)

Great Britain—

- Supplement to Journal of Board of Agriculture, June, 1910. Wheat : Papers read at a meeting of the British Association at Winnipeg, August, 1909. 8vo. 1910. (The Board.)

England and Wales—*London County Council—*

- Guardians Elections, 1910. (Number of voters on register, 1910, and numbers voting, &c.) 8vo. 1910. (Purchased.)
- Licensed Premises, 1910. Number of licensed premises at March 31, 1910, in each licensing district and in each Metropolitan borough. 16 pp., 8vo. 1910. (*Id.*)

(d) **Authors, &c.**

- Arctowski (Henryk)*. Studies on Climate and Crops. The Yield of Wheat in the United States and in Russia during 1891 to 1900. 16 pp., 8vo., 1910. (The Author.)
- Baker (C. Ashmore)*. Rates; being the Revenue and Expenditure of Boroughs and Urban District Councils of ten thousand or more inhabitants (England and Wales) analysed and compared. 33 pp., fol. 1910. (Messrs. P. S. King and Son.)
- Bertillon (Dr. Jacques)*. Statistique des successions en France et à l'étranger. 60 pp., 8vo. 1910. (The Author.)
- Cox-Sinclair (Edward S.) and Hynes (Thomas)*. Land Values. The taxation of land values under the Finance (1909-10) Act, 1910 . . . xxxii + 418 pp., 8vo. London, 1910. (Messrs. Charles Knight and Co.)
- Dalla Volta (Riccardo)*—
L'Istituto internazionale di agricoltura e i suoi primi lavori. 20 pp., 8vo. Firenze, 1910. (The Author.)
- Il conflitto costituzionale in Inghilterra. 12 pp., 8vo. Rome, 1910. (*Id.*)
- Dryden (John F.)*. Addresses and Papers on Life Insurance and other subjects by, President of the Prudential Insurance Co. of America . . . 8vo. Newark, N.J., 1909. (*Id.*)
- Edwards (Rev. George Z.)*. A Vicar as Vagrant, with introduction by Rev. Canon Denton Thompson, M.A., Rector of Birmingham. 32 pp., 8vo. 1910. (Messrs. P. S. King and Son.)
- Eijkman (P. H.)*. Fondation pour l'Internationalisme. L'Internationalisme médical. 8vo. 1910. (Major P. G. Craigie.)
- Gini (Prof. Corrado)*—
Intorno al metodo dei residui dello Stuart Mill e alle sue applicazioni alle scienze sociali. 22 pp., 8vo. 1910. (The Author.)
- Sulla variabilità dei due sessi alla nascita e nelle età adulte. 49 pp., 8vo. 1910. (*Id.*)
- Herbert (Edward G.)*. Newæra. A Socialist Romance, with a chapter on Vaccination. 8vo. London, 1910. (Messrs. P. S. King and Son.)
- Henking (Prof. Dr.)*. Überblick über den jetzigen Stand der Seefischereistatistik Deutschlands und über die Statistischen Methoden der internationalen Meeresforschung. 23 pp., 8vo. Berlin, 1909. (The Author.)

(d) **Authors, &c.—Contd.**

- Higgs (Mary)* and *Hayward (Edward E.)*. Where shall she live? The homelessness of the woman worker, written for the National Association for Women's Lodging Homes. viii + 216 pp., sm. 8vo. 1910. (Messrs. P. S. King and Son.)
- Jaffé (Edgar)*. Das englische Bankwesen. Zweite durchgesehene und erweiterte Auflage. xiii + 370 pp., 8vo. Leipzig, 1910. (Messrs. Duncker and Humblot.)
- Joly (Henri)*. Problèmes de science criminelle. 291 pp., 8vo. Paris, 1910. (Messrs. Hachette and Co., London.)
- Loch (C. S.)*. Charity and social life. A short study of religious and social thought in relation to charitable methods and institutions. xii + 496 pp., 8vo. London, 1910. (Messrs. Macmillan and Co.)
- Plehn (Carl C., Ph.D.)*. Introduction to Public Finance. 3rd edit. xv + 480 pp., 8vo. New York, 1909. (*Id.*)
- Schiavi (Alessandro)*. Il problema delle abitazioni e la produttività dei muratori (Primo contributo alle discussioni economiche nel "Musco Sociale" di Milano). 73 pp., 8vo. Torino, 1910. (The Author.)
- Strachan (Richard)*. Basis of Evaporation. Temperature of the Sea around the British Islands. Notes on climate of Ireland. 70 pp., 8vo. 1910. (*Id.*)
- Sundbärg (Gustaf)*. Aperçus statistiques internationaux. 11^e année 1908. 8vo. 1908. (Dr. J. S. Kethe.)
- Williams (F. A.)*. Temporary Annuities and Preliminary Term Policy Values. An. Exp. 4 per cent.; also tables giving net premiums for Ord. Life nine, fourteen, and nineteen payment Life, fourteen and nineteen year Endowments, one, five, ten, fifteen, and twenty years' Term Policies. 64 pp., 8vo. Mexico, 1910. (The Compiler.)
- Woman in Industry from seven points of view . . . with preface by D. J. Shackleton, M.P. xiv + 217 pp., 8vo. London, 1910. (Messrs. Duckworth.)

(e) **Societies, &c., British.**

- Tariff Reform League. Reports on Labour and Social Conditions of Germany. Vol. 1. Working Men's Tours. Nos. 1—3. 8vo. 1910. (The League.)
- Colliery Guardian. Coal Trade Pamphlets. Nos. 1—6. 12mo. 1910. (The Editor.)

ANNUAL LIST OF ADDITIONS TO THE LIBRARY.

Since December 15, 1909, the Society has received the periodical publications enumerated below. The titles are arranged alphabetically by subjects (works of a general nature coming first) under the following heads:—(a) Foreign Countries; (b) India and Colonial Possessions; (c) United Kingdom and its Divisions; (d) Authors, &c.; (e) Societies, &c. (British); (f) Periodicals, &c. (British).

(a) Foreign Countries.

Argentine Republic—

- Argentine Year-book for 1909. Maps. 8vo. London, 1909. (Purchased.)
 Anuario de la Dirección General de Estadística. Año 1908. Tomas 1 y 2. 8vo. 1909-10. (The Director-General of Statistics.)
 Agricultural Statistics for 1908. 8vo. 1909. (Dr. J. S. Keltie.)
Cordoba (Province). Anuario de la Dirección General de Estadística de la Provincia de Córdoba correspondiente al año 1908. 8vo. 1909. (The Director-General of Statistics, Cordoba.)
Tucumán (Province). Anuario de estadística de la Provincia de Tucumán correspondiente al año de 1907. 8vo. 1909. (The Director-General of Statistics, Tucumán.)

Austria-Hungary—

- Railways. K.K. Eisenbahnministerium. Bericht über die Betriebsergebnisse der verstaatlichten Linien der Priv. österr.-ungar. Staats-Eisenbahn-Gesellschaft für das Jahr 1908. 4to. 1910. (The I. and R. Ministry of Railways.)
 — Bericht über die Betriebsergebnisse der Österreichischen Nordwestbahn im Jahre 1908. 4to. 1910. (*Id.*)
 — Bericht über die Betriebsergebnisse der Süd-Norddeutschen Verbindungsbahn im Jahre 1908. 4to. 1910. (*Id.*)
 — Bericht über die Betriebsergebnisse der Böhmischen Nordbahn im Jahre 1908. 4to. 1909. (*Id.*)
 — Österreichische Eisenbahnstatistik für das Jahr 1908. Teil 1. Hauptbahnen und Lokalbahnen. Teil 2. Kleinbahnen und diesen gleichzuhaltende Bahnen sowie Schleppbahnen. 2 vols. Fol. 1910. (*Id.*)
 Trade. Berichte über die Handelsbewegung sowie Bewertung der im Jahre 1908 Ein- und Ausgeführten Waren des Vertragszollgebietes der beiden Staaten der Österreichisch-Ungarischen Monarchie. 8vo. 1910. (The Statistical Department, Ministry of Commerce.)
 — Statistik des auswärtigen Handels des Vertragszollgebiets der beiden Staaten der Österr.-Ungar. Monarchie im Jahre 1908. Band i, (Specialhandel). Band ii, (Vormerkverkehr, Durchfuhr). Band iii, (Verkehr mit den einzelnen Herkunfts- und Bestimmungsländern). 3 vols. 8vo. 1909-10. (*Id.*)

Austria—

- Österreichisches Statistisches Handbuch. 27^{er} Jahrgang 1908. 8vo. 1909. (The Central Statistical Commission.)
 Agriculture. Ernteergebnisse der wichtigsten Körnerfrüchte im Jahre 1909. 8 pp., 8vo. 1909. (*Id.*)
 — Statistisches Jahrbuch des K.K. Ackerbau-Ministeriums für 1909. Statistik der Ernte des Jahres 1909. 8vo. 1910. (*Id.*)
 Education. Statistik der Unterrichtsanstalten in den im Reichsrate vertretenen Königreichen und Ländern für 1906-07. Fol. 1910. (*Id.*)

(a) Foreign Countries—Contd.

Austria—Contd.

Finance. Mitteilungen des K.K. Finanzministeriums. Jahrgang 15. Heft 2. Dezember 1909. 8vo. 1909. (The Ministry of Finance.)

Justice. Die Ergebnisse der Strafrechtspflege in den im Reichsrath vertretenen Königreichen und Ländern im Jahre 1907. Fol. 1910. (*Id.*)

— Statistische Nachweisungen über das zivilgerichtliche Depositenwesen, die kumulativen Waisenkassen und über den Geschäftsverkehr der Grundbuchsämter (Veränderungen im Besitz- und Lastenstande) im Jahre 1907. Fol. 1909. (*Id.*)

Labour. Die Arbeitseinstellungen und Aussperrungen in Österreich während des Jahres 1908. 8vo. 1910. (The Austrian Labour Department.)

Mines. Statistik des Bergbaues in Österreich für 1908. Lief. 2. Betriebs- und Arbeiterverhältnisse beim Bergbau. Naphthastatistik. 8vo. 1909. (The Ministry of Public Works.)

Postal. Statistik des österreichischen Post- und Telegraphenwesens im Jahre 1908. 8vo. 1909. (The Ministry of Commerce.)

Public Health. Statistik des Sanitätswesens in den im Reichsrath vertretenen Königreichen und Ländern für 1906. Fol. 1910. (The Central Statistical Commission.)

Bohemia—

Statistisches Handbuch des Königreiches Böhmen. I. 8vo. 1909. (The Royal Statistical Bureau.)

Agriculture. Anbau u. Erntestatistik . . . für 1907-08 und 1908-09. 2 vols., 8vo. 1909-10. (*Id.*)

Belgium—

Army. Statistique médicale de l'armée belge. Année 1908. 8vo. 1909. (The Belgian Government.)

Finance. Budgets des recettes et des dépenses du Royaume pour l'exercice 1910. Fol. 1909. (Dr. J. S. Keltie.)

Labour. Rapports annuels de l'inspection du travail. 14^e année (1908). 8vo. 1909. (The Ministry of Industry and Labour.)

Mines. Annales des Mines de Belgique. Année 1910. Tome 15. Livr. 1 et 2. 8vo. 1910. (The Administration of Mines.)

Railways. Chemins de fer, postes, télégraphes, téléphones, et marine. Compte-rendu des opérations pendant 1907 et 1908. 2 vols., fol. 1908-09. (Dr. J. S. Keltie.)

Brussels. Ville de Bruxelles, 4^e Division administrative. Rapport annuel. Démographie. Statistique médicale. Salubrité publique. Hygiène. Année 1908. 8vo. 1909. (The Department of Health.)

Bruges. Stad Brugge. Verslag over het bestuur en den toestand van stadszaken voor 1908. 8vo. 1909. (The Ministry of the Interior.)

Hasselt. Exposé de l'administration et de la situation des affaires communales pendant 1908-09. 8vo. 1910. (The Burgomaster.)

Annuaire de l'Académie Royale des Sciences de Belgique, 1910. 76^e Année. Sm. 8vo. 1910. (The Academy.)

Brazil—

Brazilian Year-book, issued under the patronage of the Brazilian Government. 2nd issue, 1909. Compiled and edited by J. P. Wilcman. 8vo. 1909. (Messrs. McCorquodale & Co.)

Trade. Importacao e Exportacao, Movimento marítimo, cambial e do cafe da Republica dos Estados Unidos do Brazil em 1908. 4to. 1909. (The Director of Commercial Statistics.)

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Vital Statistics—From Egypt, Germany, Italy, Netherlands, Roumania, Switzerland, United States (California, Connecticut, and Michigan only), the Australian Commonwealth, South Australia, and United Kingdom.

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ROYAL STATISTICAL SOCIETY.

(FOUNDED 1834. INCORPORATED 1887.)

9, ADELPHI TERRACE,

STRAND, W.C., LONDON.

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1910.

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NOTICES TO FELLOWS.

July, 1910.

THE Council desire to call the attention of the Fellows to the fact that notwithstanding the change in the name of the Society by the addition of the word "Royal," they are still, in using letters after their names, signifying the membership of the Society, only entitled, under Rule 6, to use the letters F.S.S.

ANNUAL Subscriptions are due in advance, on the 1st of January in each year. A form for authorising a Banker or Agent to pay the subscription Annually will be forwarded on application to the Assistant Secretary. When convenient, this mode of payment is recommended. Drafts should be made payable to the order of "The Royal Statistical Society," and crossed "*Drummond and Co.*"

IN order to be included in the Ballot at any particular Ordinary Meeting, the nomination papers of candidates for Fellowship should be lodged at the Office of the Society at least six days before the date of such Meeting. Nomination papers may be obtained on application to the ASSISTANT SECRETARY.

FELLOWS wishing to receive special and separate notices of papers to be read before the Society at the Ordinary Meetings should communicate with the ASSISTANT SECRETARY.

THE Ordinary Meetings of the Society are held at 5 p.m., at The Society's Rooms, 9, Adelphi Terrace, Strand, W.C., unless otherwise stated.

Particulars as to papers to be read, and the time and place of meeting, will be found advertised in "The Times" and in other London daily papers on the Saturday preceding the date of each meeting. The attention of Fellows is particularly directed to these announcements.

EACH volume of the *Journal* is now issued in eight parts. Copies of the current issues will be delivered carriage free as heretofore to all Fellows of the Society. The price of each part will be 2s. 6d. to the general public, and the subscription, including postage, one guinea per annum. Addressees who fail to receive the *Journal* at the proper time are requested to communicate with the ASSISTANT SECRETARY without delay.

THE Library and the Reading Room are open daily for the use of Fellows from 10 a.m. to 5 p.m., excepting on Saturdays, when they are closed at 2 p.m. During October to June the Library and Reading Room are open as follows:—Monday to Friday, 10 a.m. to 7 p.m.; Saturday, 10 a.m. to 2 p.m. (public holidays excepted).

It is requested that any change of address may be notified promptly to the ASSISTANT SECRETARY.

OUTLINE OF THE OBJECTS OF THE SOCIETY.

THE *Royal Statistical Society* was founded on the 15th of March, 1834, in pursuance of a recommendation of the British Association for the Advancement of Science, its objects being the careful collection, arrangement, discussion and publication of facts bearing on and illustrating the complex relations of modern society in its social, economical and political aspects, especially facts which can be stated numerically and arranged in tables; and also, the formation of a Statistical Library as rapidly as its funds would permit.

From its inception the Society has steadily progressed. It now possesses a valuable Library of about 50,000 volumes, and reading rooms. Monthly meetings are held from November to June, which are well attended, and cultivate among its Fellows an active spirit of investigation. The Papers read at these meetings, with an abstract of the discussions thereon, are published in the *Journal*, which now consists of seventy-two annual volumes, and forms of itself a valuable library of reference.

The Society has originated and statistically conducted many special inquiries on subjects of economic or social interest, of which the results have been published in the *Journal*, or issued separately.

To enable the Society to extend its sphere of useful activity and accomplish in a yet greater degree the various ends indicated, an increase in its numbers and revenue is desirable. With the desired increase in the number of Fellows, the Society will be enabled to publish standard works on Economic Science and Statistics, especially such as are out of print or scarce, and also greatly extend its collection of foreign works. Such a well-arranged Library for reference as would result does not at present exist in England, and is obviously a great *desideratum*.

The Society is cosmopolitan, and consists of Fellows and Honorary Fellows, together forming at the present time a body of about *nine hundred* Members.

The annual subscription to the Society is *Two Guineas*, and at present there is no entrance fee. Fellows may, on joining the Society or afterwards, compound for all future annual subscriptions by a payment of *Twenty Guineas*.

The Fellows of the Society receive gratuitously a copy of each part of the *Journal* as published, and have the privilege of purchasing back numbers at a reduced rate. The Library (reference and circulating) and the Reading Rooms are open daily for the convenience of Members.

Nomination Forms, with any further information, will be furnished, on application to the *Assistant Secretary, Royal Statistical Society*, 9, *Adelphi Terrace, Strand, W.C., London*.

LIST OF PUBLICATIONS.

Note.—Sets or separate numbers of the *Journal*, or of the other publications of the Society (if not out of print), may be obtained at the Offices of the Society, or through any bookseller. Fellows may purchase these publications at a reduced rate.

	Price.
Journal (published quarterly)—	
Vols. 1—72. 8vo. 1838-1909	5s. each part*
Journal (published monthly during the session).	
New Series—	
Vol. 73. 1910	2s. 6d. each part.
General Analytical Index to Vols. 1—71 of the Journal (1838-1908). In 5 parts. 8vo.—	
(i) Vols. 1—15 (1838-52)	7s. 6d.
(ii) Vols. 16—25 (1853-62)	10s. 0d.
(iii) Vols. 26—35 (1863-72)	3s. 6d.
(iv) Vols. 36—50 (1873-87)	3s. 6d.
(v) Vols. 51—71 (1888-1908)	3s. 6d.
Subject-Index to the Journal, Vols. 28—57, 1865-94	1s. 6d.
Reports of the Committee appointed 20th November, 1900, to inquire into the statistics available as a basis for estimating the production and consumption of meat and milk in United Kingdom; with observations by Mr. R. H. Rew. 8vo. 1904	1s.
Catalogue of the Library—	
573 pp. Cloth, super royal 8vo. 1884..	10s.
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Catalogue of the Library—	
276 pp. Cloth, 8vo. 1903	10s. 6d.
Jubilee Volume—	
xv + 372 pp. Cloth, 8vo. 1885.....	10s. 6d.
List of Fellows, containing the Rules and Bye-Laws of the Society, and corrected annually to 31st December, are issued gratuitously.	

* Before 1870 the price varied.

LIST OF THE Society's Guy Medallists, *With the Date of the Awards.*

Medals in GOLD have been awarded as follows—

1892. The Rt. Hon. CHARLES BOOTH, F.R.S.	1900. Sir J. ATHELSTANE BAINES, C.S.I.
1894. Sir ROBERT GIFFEN, F.R.S.	1907. Prof. F. Y. EDGEWORTH, M.A., F.B.A.
1908. Major P. G. CRAIGIE, C.B.	

Medals in SILVER have been awarded as follows—

NAME.	TITLE OF PAPER.
1893. Sir JOHN GLOVER, J.P.	<i>*Tonnage Statistics of the Decade, 1880-1890.</i>
1894. Mr. A. SAUERBECK.	<i>Prices of Commodities during the last Seven Years.</i>
1895. Mr. A. L. BOWLEY, M.A.	<i>Changes in Average Wages (Nominal and Real) in the United Kingdom between 1860 and 1891.</i>
1897. Mr. FRED. J. ATKINSON.	<i>Silver Prices in India.</i>
1899. Professor CHARLES S. LOCH, D.C.L.	<i>Poor Relief in Scotland: its Statistics and Development, 1791-1891.</i>
1900. Mr. R. F. CRAWFORD.	<i>Notes on the Food Supply of the United Kingdom, Belgium, France, and Germany.</i>
1901. Mr. T. A. WELTON, F.I.A.	<i>Distribution of Population in England and Wales in the Period of Ninety Years from 1801 to 1891.</i>
1902. Mr. R. H. HOOKER, M.A.	<i>Suspension of the Berlin Produce Exchange, and its effect on Corn Prices.</i>
1903. M. YVES GUYOT.	<i>The Sugar Industry on the Continent.</i>
1904. Mr. D. A. THOMAS, M.A., M.P.	<i>The Growth and Direction of our Foreign Trade in Coal during the last Half Century.</i>
1905. Mr. R. H. REW.	<i>Reports of the Committee on Meat and Milk Production.</i>
1906. Dr. W. N. SHAW, F.R.S.	<i>Seasons in the British Isles from 1878.</i>
1907. Mr. NOEL A. HUMPHREYS, I.S.O.	<i>The Alleged Increase of Insanity.</i>
1909. Sir EDWARD W. BRABROOK, C.B.	<i>Social Insurances, and his earlier Papers on the Progress of Friendly Societies.</i>
1910. Mr. G. H. WOOD.	<i>Wages in Different Industries in the United Kingdom in the Nineteenth Century.</i>

* This paper was one of a series which now contains five decennial reviews.

LIST

OF THE

Society's Howard Medallists.

NAME.	SUBJECT OF COMPETITION.
1875. Mr. EDWARD SMITH.	<i>Influence of improved Dwellings of the Poor in Rural Districts of England.</i>
1876. Dr. J. C. STEELE.	<i>Past and Present Mortality of Hospitals in the United Kingdom.</i>
1878. Dr. JOHN MARTIN and Captain H. HILDYARD (<i>extra Prize</i>).	<i>Effects of Health and Disease on Military and Naval Operations.</i>
1879. Miss B. JOURDAN.	<i>Improvements in Education of Children in Eighteenth and Nineteenth Centuries.</i>
1880. Mr. H. P. POTTER.	<i>The Oriental Plague, and Howard's Labours on the subject.</i>
1881. Dr. F. POLLARD.	<i>On the Jail Fever, from the earliest Black Assize to the latest Outbreak.</i>
1882. Mr. D. MANSON FRASER.	<i>State of English Prisons in the Eighteenth Century, and its relation to Small-Pox.</i>
1883. Dr. R. D. R. SWEETING.	<i>John Howard on Health of Inmates of Prisons, Workhouses, and other Public Institutions.</i>
1884. Dr. CLEMENT DUKES.	<i>Howard's Opinions on the Preservation of Health as affected by Personal Habits.</i>
1893. Dr. HUGH R. JONES.	<i>Perils and Protection of Infant Life.</i>
1895. Mr. JOHN WATSON.	<i>Reformatory and Industrial Schools.</i>
1897. Dr. JAMES KERR.	<i>School Hygiene.</i>
1899. Miss ROSA M. BARRETT.	<i>Sentences on, and Punishments of, Juvenile Offenders in Europe and the United States.</i>
1900. Dr. J. F. J. SYKES.	<i>Housing of the Working Classes in London and other large Towns.</i>
1904. Mr. LEONARD WARD.	<i>Effects of State Regulation of Dangerous Trades on Health of Workers.</i>
1908. Mr. PERCY E. BRAUN, B.Sc.	<i>The Cost, Conditions and Results of Hospital Relief in London.</i>

NOTICE.—The subject appointed for the next "Howard Medal" Essay Competition (Session 1910-11) is: "**A Statistical Review of the Variations during the last Twenty Years in the Consumption of Intoxicating Drinks in the United Kingdom, and in Convictions for Offences connected with Intoxication; with a Discussion of the Causes to which these Variations may be ascribed.**" The competition is open to the public, and a statement of the conditions may be obtained from the Assistant Secretary.

ROYAL STATISTICAL SOCIETY.

Each Fellow is entitled to receive one copy of each part of the Society's "JOURNAL," as published, forming in the course of the year a volume of about 800 pages. Fellows may obtain additional copies, and copies of back issues (with certain exceptions) at three-fifths of the publishing price.

The Society's LIBRARY comprises about 50,000 volumes, including the most important statistical publications, serial and other, of British or foreign Governments, as well as a large collection of general statistical and economic works. A copy of the Catalogue, published in 1908, is obtainable by each Fellow free of cost. The Reading Rooms are open daily for the use of Fellows from 10 a.m. to 5 p.m. (Saturdays 10 a.m. to 2 p.m.). During the months of October to June, the Library and Reading Room will be open as follows:—Monday to Friday, 10 a.m. to 7 p.m. Saturday, 10 a.m. to 2 p.m. (Public holidays excepted). Fellows may also, under the regulations, borrow books up to the number of ten at a time.

Fellows wishing to receive special and separate notices of each paper to be read before the Society at the Ordinary Meetings should communicate with the Assistant Secretary.

FELLOWSHIP is attained by election.

CANDIDATES must be proposed and seconded by Fellows of the Society, who, either from personal or general knowledge, vouch for the Candidate's qualification and eligibility. On the nomination of the Council, Candidates may be elected as Fellows by a Ballot taken at any Ordinary Meeting of the Society.

There is at present no entrance fee and the SUBSCRIPTION is TWO GUINEAS per annum.

In lieu of the annual subscription, a COMPOSITION of twenty guineas is accepted.

Further particulars, Lists of Fellows, Copies of the Rules, &c., may be obtained on application to THE ASSISTANT SECRETARY, ROYAL STATISTICAL SOCIETY, 9, Adelphi Terrace, Strand, W.C., London.

ROYAL STATISTICAL SOCIETY.

Founded 15th March, 1834, Incorporated 31st January, 1887.

LIST OF THE Patrons and Presidents of the Society.

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HIS MOST GRACIOUS MAJESTY KING EDWARD VII	1901-10
HIS MOST GRACIOUS MAJESTY KING GEORGE V.	1910

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Sir Jervoise A. Baines, C.S.I.	1909-10
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LIST OF FELLOWS.

The names of Present Members of Council are printed in SMALL CAPITALS.

Those marked *c* have Served or are Serving on the Council.

„ *d* have made Presentations to the Library.

„ *p* have contributed Papers to the Society.

„ * have compounded for their Annual Subscriptions.

Year of Election.		
1904	<i>d</i>	*à Ababrelton, Robert, F.R.G.S., 161, Sixth-avenue, Little Ilford, Essex.
1907		*à Ababrelton, Robert R. de R., F.R.E.S., Registry and Record Dept., India Office, S.W.
1906		Abrahams, E. Goldsmid, Albany Courtyard, Piccadilly, W.
1888		Ackland, Thomas G., F.I.A. (5 and 6, Clement's Inn), The Thatched House, Muswell-hill, Highgate, N.
1888	<i>c d p</i>	Acland, The Right Hon. A. H. Dyke, M.A., Dunkery House, Felistowe.
1892	<i>c d p</i>	Acworth, William M., M.A. The Albany, Piccadilly, W.
1905	<i>d p</i>	Adams, W. G. S., M.A., Dept. of Agri. and Tech. Instruction, Dublin.
1902	<i>d</i>	Adeane, Charles R. W., Babraham Hall, near Cambridge.
1884		Agins, Edward T., 3, Belsize-grove, N.W.
1888		*Airedale, Rt. Hon. Lord, Gledhow Hall, Leeds.
1910		Akers, Alfred, 31, Walbrook, E.C.
1908		Alexander, Charles S., Taipeng, Perak, Federated Malay States.

Year of Election.		
1896		Allen, George B., <i>Free Chase, Warminglid, Hayward's Heath.</i>
1908		Allen, H. C., <i>Buenos Ayres Gt. Southern Rly. Co., Ltd., River Plate House, Finsbury Circus, E.C.</i>
1898		Allen, William H., <i>Bromham House, Bromham, near Bedford.</i>
1880		*Allerton, The Right Hon. Lord, <i>Chapelallerton, Leeds.</i>
1893	d	Anderson, Herbert W., C.E., <i>S.W. Laboratory, 43, St. James's-rd., Kingston.</i>
1889		Anderson, John A., <i>Faversham, Kent.</i>
1907	d	Andersson, Thor E. E., Ph.D. <i>Ynglingagatan 17, Stockholm.</i>
1886		Andras, Henry W., F.J.A., <i>50, Regent-street, W.</i>
1871		Angus, R. B., <i>Montreal, Canada.</i>
1897		Anning, Edward H., F.R.G.S., <i>78, Cheapside, E.C.</i>
1884		Anning, Edward J., <i>78, Cheapside, E.C.</i>
1906		Archer, Walter E., <i>17, Sloane-court, S.W.</i>
1872		*Archibald, William F. A., M.A., <i>114, Royal Courts of Justice, Strand, W.C.</i>
1892	d	Argyle, Jesse, <i>86, Aberdeen-road, Highbury, N.</i>
1906		Arkell, George E., <i>107, Ivanhoe-road, Denmark-park, S.E.</i>
1888		Asch, William, <i>62½, Old Broad-street, E.C.</i>
1908		Ashley, Percy W. L., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1909	c d	ASKWITH, GEORGE R., K.C., C.B., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1909		Astor, Waldorf, <i>Astor Estate Office, Victoria-embankment, W.C.</i>
1888	d	Atkinson, Charles, <i>56, Palewell-park, East Sheen.</i>
1893	d p	Atkinson, Frederic J., <i>c/o Messrs. Henry S. King & Co., 9, Pall Mall, S.W.</i>
1865	c d p	AVEBURY, RIGHT HON. LORD, F.R.S. (<i>Honorary Vice-President</i>), <i>High Elms, Farnbro', R.S.O Kent.</i>
1904		Avery, John, F.C.A., <i>23, St. Swithin's-lane, E.C.</i>
1893		*Aves, Ernest, M.A., <i>12, Thurlow-road, Hampstead, N.W.</i>

Year of Election.		
1872	c d	*Babbage, Major-General Henry P., <i>Mayfield, Lansdown, Cheltenham.</i>
1892		Bacon, George W., F.R.G.S., <i>127, Strand, W.C.</i>
1909		*Bagnall, Bernard T. S., A.C.A., <i>Myrtleville, Tavistock-road, Plymouth.</i>
1855	c d	BAILEY, ARTHUR H., F.I.A., <i>26, Mount Ephraim-road, Streatham, S. W.</i>
1908		Bailey, Frederick, <i>"Lesma," Queen's-road, Springfield, Chelmsford.</i>
1907		Bailey, Walter, <i>The Gobbins, Burton-road, Derby.</i>
1881	c d p	BAINES, SIR J. ATHELSTANE, C.S.I. (Hon. Vice-President), <i>Kidlington, Oxon.</i>
1906	p	Baldwin-Wiseman, William R., M.Sc., A.M. Inst. C.E., <i>24, Winchester-road, Southampton.</i>
1878		Balfour, The Right Hon. Arthur J., M.P., F.R.S. <i>4, Carlton-gardens, S. W.</i>
1886		Balfour, The Right Hon. Gerald W., <i>Fishers-hill, Woking.</i>
1907		Balleine, Arthur E., <i>4, Whitehall-place, S. W.</i>
1903	d	Bamber, Lieut.-Col. Charles J., D.P.H., <i>Sanitary Comm. to Gov. of the Punjab, Lahore.</i>
1910		Barker, J. Ellis, <i>Constitutional Club, Northumberland-avenue, W.C.</i>
1887		Barnes, Joseph H., F.I.A., <i>19, Lombard-street, E.C.</i>
1885		Barratt, Thomas J., <i>Bell-Moor, Hampstead Heath, N. W.</i>
1887		*Barrett, Thomas S., F.Z.S., M.A.I., &c., <i>Rose Cottage, Millfield-road, Widnes.</i>
1888		*Bartlett, Frederick W., <i>Paymaster General's Office, Whitehall, S. W.</i>
1907	d	Bassett, Herbert H., <i>"Darentlea," Eynsford, Kent.</i>
1889	d	Bastable, Professor C. F., M.A., LL.D., <i>52, Brighton-road, Rathgar, Dublin.</i>
1877	c d p	BATEMAN, SIR ALFRED E., K.C.M.G. (Hon. Vice-President), <i>Woodhouse, Wimbledon-park, S. W.</i>
1877		Bayfield, Arthur, <i>95, Colmore-row, Birmingham.</i>

Year of Election.		
1873		*Baynes, Alfred H., F.R.G.S., J.P., <i>Fitzwalters, Northwood, Middlesex.</i>
1905		Beaven, Edwin S., <i>Eastway, Warminster.</i>
1882	d	*Beazeley, Michael W., M.A., <i>Worting, Basingstoke.</i>
1882	c d	*Beeton, Henry R., <i>9, Maresfield-gardens, Hampstead, N.W.</i>
1899	d	Beeton, Mayson M., B.A.,
1886	d	Begg, Ferdinand F., <i>Bartholomew House, E.C.</i>
1884	d	Bell, James T., <i>330, Mansfield-road, Nottingham.</i>
1901		Bellingham, Archer. <i>Walcot, Burghley-road, Wimbledon.</i>
1908	d	*Bellom, Professor Maurice, <i>6, rue Daubigny, Paris, XVII.</i>
1910		Bennett, Samuel, <i>Registrar of Friendly Societies,</i> <i>Perth, Western Australia.</i>
1888		*Benson, Godfrey R., <i>108, Eaton-square, S.W.</i>
1884		*Bentley, Richard, F.R.G.S., <i>Upton, Slough, Bucks.</i>
1910		Beresford, Frank, <i>22, Barnsbury-park, N.</i>
1907		Bernard, Major Francis T. H., <i>Chearsley Hall, Aylesbury.</i>
1890		Berry, Arthur, M.A., <i>King's College, Cambridge.</i>
1891		Berry, Oscar, C.C., F.C.A., <i>Monument House, Monument-square, E.C.</i>
1909		Beveridge, William H., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1869	p	*Beverley, The Hon. Mr. Justice Henry, <i>Nascot Lodge, Watford.</i>
1888		Billinghurst, Henry F., <i>7, Oakcroft-road, Blackheath, S.E.</i>
1899	c	Birchenough, Henry, C.M.G., M.A., <i>79, Eccleston-square, S.W.</i>
1901		Bird, Harry, C.C., <i>Connaught Lodge, Chingford, Essex.</i>
1881	d	Bishop, George, <i>113, Powis-street, Woolwich.</i>
1902		Bisset-Smith, George T., <i>55, Carlton-place, Aberdeen.</i>
1898		Blount, Edward T. J., F.F.A., A.I.A., <i>Standard Life</i> <i>Insurance Co., 3, George-street, Edinburgh.</i>
1898	c d	*Blyth, Rt. Hon. Lord, <i>Stansted, Essex; and 33, Portland-place, W.</i>

Year of Election.		
1907		Boddy, Henry M., <i>Manufacturers Life Insurance Co., Rhodes Buildings, St. George's-street, Cape Town.</i>
1881		Bolitho, Thomas R., <i>Trengwainton, Hea Moor, R.S.O., Cornwall.</i>
1890		Bolton, Edward, J.P., <i>325, Anlaby-road, Hull.</i>
1885	c d	*Bonar, James, M.A., LL.D., <i>The Mint, Ottawa, Canada.</i>
1887	c	BOND, EDWARD, M.A. <i>43, Thurloe-square, S. W.</i>
1905		*Bonn, Max J., <i>43, Park-lane, W.</i>
1885	c d p	BOOTH, RT. HON. CHARLES, D.C.L., D.Sc., F.R.S. (<i>Hon. Vice-President</i>), 11, <i>Adelphi-terrace, Strand, W.C.; Stanfield House, High-street, Hampstead, N. W., c/o Jesse Argyle.</i>
1909		Bowers, F. Gatus, <i>12, Elgin-road, Seven Kings, Essex.</i>
1894	c d p	BOWLEY, ARTHUR L., M.A., <i>Northcourt-avenue, Reading.</i>
1909		Boyd-Carpenter, Archibald, <i>22, Park avenue, Harrogate.</i>
1894	c d p	BRABROOK, SIR EDWARD W., C.B., Dir. S.A. (<i>Vice-President</i>), 178, <i>Bedford-hill, Batham, S. W.</i>
1883		Braby, Frederick, F.C.S., F.G.S., <i>Bushey Lodge, Teddington.</i>
1900	d p	Branford, Victor V., M.A., <i>River Plate House, 13, South-place, E.C.</i>
1873	c d p	BRASSEY, THE RIGHT HON. LORD, G.C.B. (<i>Honorary Vice-President</i>), 24, <i>Park-lane, W.</i>
1903	d p	Brassey, The Hon. Thomas A., <i>Park-gate, Battle.</i>
1907	p	Braun, Percy E., B.Sc., <i>London County Council, Spring Gardens, S. W.</i>
1864		*Braye, The Right Hon. Lord, <i>Stanford Hall, Market Harborough.</i>
1910		Breul, Ernest, D.T.E., <i>223, Brunswick-street, Oxford-rd., Manchester.</i>
1908	d	Bright, Charles, F.R.S.E., <i>26, Devonshire-terrace, Hyde Park, W.</i>
1902	d	Broadbent, Albert, <i>257, Deans Gate, Manchester.</i>
1906		Brook, Herbert E. J., <i>The Cottage, Hedon, East Yorks.</i>
1874		Broom, Andrew, A.C.A., <i>Eaglehurst, Staines, Middlesex.</i>
1895	d	Broomhall, George J. S., <i>17, Goree Piazzas, Liverpool.</i>
1878		Brown, Sir Alexander H., Bart., <i>12, Grosvenor-gardens, S. W.</i>

Year of Election.		
1901		Brown, B. Hal., <i>London & Lancs. Life Insurance Co., Montreal, Canada.</i>
1896		*Brown, Daniel M., <i>P.O. Box 187, Carra Linn, Port Elizabeth.</i>
1893		Brown, James W. B., F.S.A.A., <i>Prudential-buildings, Corporation-st., Birmingham.</i>
1903	d	Brown, S. Stanley, <i>Hamilton House, Victoria Embankment, E.C.</i>
1875	p	Browne, Thomas G. C., F.I.A., <i>11, Lombard-street, E.C.</i>
1908		Brownlee, John, M.D., D.Sc., <i>Ruchill Fever Hospital, Glasgow.</i>
1886		*Brunner, The Rt. Hon. Sir John T., Bart., <i>9, Ennismore-gardens, S.W.</i>
1909		*Buchanan, Dr. James, M.A., D.Sc., F.F.A., F.I.A., <i>9, St. Andrew-square, Edinburgh.</i>
1880	c d p	*Burdett, Sir Henry C., K.C.B., <i>The Lodge, Porchester-square, W.</i>
1884	d	Burdett-Coutts, William, M.P., <i>1, Stratton-street, Piccadilly, W.</i>
1902		Burgess, James H., F.S.A.A., <i>Bergen House, St. Catherine's, Lincoln.</i>
1897		Burke, David, A.I.A., <i>Royal Victoria Life Insurance Co., Montreal.</i>
1905		Burns, Thomas R., <i>13, Donegall-square-north, Belfast.</i>
1895		Burrupe, J. Arthur Esq., <i>Custom House, Calcutta, India.</i>
1880		Burt, Frederick, F.R.G.S., <i>Pinewood, Stoke Poges, R.S.O. nr. Slough, Bucks.</i>
1901		Burt, George S., <i>The Lancashire Watch Co., Ltd., Prescott.</i>
1906		Bush, Joseph H., <i>"Varaville," Crambrook-road, Ilford.</i>
1892		Byworth, Charles J., F.S.A.A., <i>The Limes, Sutton Common-rd., Benhilton, Surrey.</i>
1902	d	Caillard, Sir Vincent H. P., <i>42, Half Moon-street, W.</i>
1897		Cairnes, Frederick Esq., <i>Killester House, Raheny, Co. Dublin.</i>
1903		Caldwell, William, <i>162, Bath-street, Glasgow.</i>

Year of Election.		
1896		Campbell, Charles W., C.M.G., <i>British Legation, Peking, China.</i>
1905	<i>d</i>	Campbell, Richardson, 37, <i>Lansdowne-road, Crumpsall, Manchester.</i>
1879		Campbell-Colquhoun, Rev. John E., <i>Chartwell, Westerham, Kent.</i>
1889	<i>d p</i>	Cannan, Prof. Edwin, M.A., LL.D., 11, <i>Chadlington-road, Oxford.</i>
1891	<i>d</i>	Canon, Henry W., <i>Chase National Bank,</i> 83, <i>Cedar-street, New York, U.S.A.</i>
1900	<i>d</i>	Canovai, Commendatore Tito, <i>Bank of Italy, Rome.</i>
1904		Carrington, John B., F.S.A.A., 20, <i>Blomfield-road, Maida Vale, W.</i>
1910		Carson, H. C., 193, <i>Spadina-road, Toronto, Canada.</i>
1890		*Carter, Eric M., A.I.A., F.C.A., 33, <i>Waterloo-street, Birmingham.</i>
1883	<i>d</i>	*Carter, Joseph R., <i>Courtfield, Ross-road, Wallington, Surrey.</i>
1881		Causton, Right Hon. Richard K., M.P., 12, <i>Devonshire-place, Portland-place, W.</i>
1907		*Chabot, Marius T., 94, <i>Haringvliet, Rotterdam, Holland.</i>
1884	<i>d</i>	*Chailley-Bert, Joseph, <i>Union Coloniale Française,</i> 44, <i>Chaussée d'Antin, Paris.</i>
1880		*Chamberlain, The Right Hon. Joseph, M.P., F.R.S., <i>Highbury, Moor Green, Birmingham.</i>
1901	<i>d p</i>	Chance, Sir William, Bart., J.P., <i>Orchards, near Godalming.</i>
1903		Channing, Sir Francis A., Bart., M.P., 40, <i>Eaton-place, S.W.</i>
1886	<i>d p</i>	*Chapman, Samuel, 225—228, <i>Gresham House, Old Broad-st., E.C.</i>
1903	<i>c d p</i>	CHAPMAN, PROFESSOR SYDNEY J., M.A., <i>Owens College, Manchester.</i>
1901	<i>d</i>	Chapman, Walter W., 4, <i>Mowbray House, Norfolk-street, Strand, W.C.</i>
1904		Charles, Thomas E., 52, <i>Sandrock-road, Lewisham, S.E.</i>
1892		*Chatham, James, F.I.A., F.F.A., 7, <i>Belgrave-crescent, Edinburgh.</i>
1903	<i>d</i>	Chiozza-Money, Leo G., "Tyhurst," <i>Chaldon-by-Caterham, Surrey.</i>
1886	<i>c d p</i>	*Chisholm, George G., M.A., B.Sc., F.R.G.S., 12, <i>Hallhead-rd., Craigmillar Pk., Edinburgh.</i>
1906		Choles, Herbert J., <i>Dept. of Agriculture; Pietermaritzburg, Natal.</i>
1904		Clark, Prof. Arch. Brown, <i>Department of Political Economy, University of Manitoba, Winnipeg, Man., Canada.</i>

Year of Election.		
1909		Clark, Albert Hawkins, A.M.I.C.E., 58, <i>Elmbourne-road, Tooting Common, S.W.</i>
1909		Clark, Dr. Charles C., <i>Bureau of Statistics, Dept. of Agriculture, Washington, D.C., U.S.A.</i>
1901	c	Clark, William H., C.M.G. (<i>Hon. Secretary</i>), <i>Treasury Chambers, Whitehall, S.W.</i>
1882	c d	*CLARKE, SIR ERNEST, 31, <i>Tavistock-square, W.C.</i>
1877	c d	*Clarke, Henry, L.R.C.P., <i>Courns Wood, Hughenden, High Wycombe.</i>
1890		Clarke, Henry, J.P., <i>Cannon Hall, Hampstead, N.W.</i>
1908		Clarke, John J., 48, <i>Laurel-road, Fairfield, Liverpool.</i>
1899		Claughton, Gilbert H., <i>The Priory, Dudley.</i>
1908		Clay, Sir Arthur T. F., Bart., 19, <i>Hyde Park Gate, S.W.</i>
1907		Cleaver, Edgar J., F.A.A., 34, <i>Dover-street, W.</i>
1907		Clements, Lieut.-Col. H. C., V.D., <i>Cheyton, Lismore-road, South Croydon.</i>
1910		Cocker, Edwin, 182, <i>Weaste-lane, Pendleton, Manchester.</i>
1893	c d p	COGHLAN, TIMOTHY A., I.S.O., 123 and 125, <i>Cannon-street, E.C.</i>
1905		*Cohen, C. Waley, M.A., 11, <i>Hyde Park-terrace, W.</i>
1887	c d	Cohen, Nathaniel L., 11, <i>Hyde Park-terrace, W.</i>
1859		Coles, John, F.I.A., 4, <i>Kensington Park-gardens, W.</i>
1905		Coles, Richard J., F.O.I.S., <i>Addenbrooke's Hospital, Cambridge.</i>
1892	d p	*Collet, Miss Clara E., M.A., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1895		Collins, Howard J., <i>The General Hospital, Birmingham.</i>
1906		Collins, Percy, 81-83, <i>Cheapside, E.C.</i>
1882		*Collum, Rev. Hugh R., M.R.I.A., F.R.C.I., 35, <i>Oakley-street, Chelsea, S.W.</i>
1906		Contractor, Burjorjee Cawasjee, <i>New Markers Buildings, Apollo-street, Bombay.</i>
1903	d	Cook-Watson, Ralph, <i>Standard Chambers, Neville-st., Newcastle-on-T.</i>
1887		Cooke-Taylor, R. Whately, <i>High Trees, Chepstow.</i>
1888		*Cooke-Taylor, Theodore, J.P., <i>Sunny Bank, Batley, Yorkshire.</i>

Year of Election.		
1891	<i>d</i>	Cooper, Joseph, 23, <i>Rawson-street, Farnworth, near Bolton.</i>
1906		Cornish, George F., <i>New House, Knowle St. Giles, Chard, Somerset.</i>
1889		Cornwallis. Fiennes S. W., <i>Linton-park, Maidstone, Kent.</i>
1899	<i>d</i>	Court, Stephen E., 11, <i>Courtfield-gardens, S. W.</i>
1862	<i>c d p</i>	COURTNEY, RIGHT HON. LORD (<i>Hon. Vice-President</i>), 15, <i>Cheyne Walk, Chelsea, S. W.</i>
1902		*Coxon, William, 15, <i>Elsworthy-terrace, N. W.</i>
1907		Coyagi, Professor Jehangi,
1871	<i>d</i>	Cozens-Smith, Edward, 16, <i>Kensington-square, W.</i>
1874	<i>c d p</i>	GRAIGIE, MAJOR P. G., C.B. (<i>Hon. Vice-President</i>), <i>Bronté House, Lympstone, Devon.</i>
1910		Crammond, Edgar, 33, <i>Gorsehill-road, New Brighton, Cheshire.</i>
1906		Craske. Harold, <i>Kyle Lodge, Letchworth, Herts.</i>
1902		Craven, Edward J. E., <i>Secretary's Office, H.M. Customs and Excise, Ocean House, E.C.</i>
1890	<i>c d p</i>	Crawford, Richard F., <i>c/o F. R. Sneath, Esq., 1, New- court, Lincoln's Inn, W.C.</i>
1891		*Crawley, Charles E., <i>Lanhydrock Villa, Truro, Cornwall.</i>
1878		Crewdson, Ernest, <i>Grinstead, Green-lane, Buxton, Derbyshire.</i>
1892		Cripps, Sir C. Alfred, K.C.V.O., M.P. 1, <i>Essex-court, Temple, E.C.</i>
1890		Croal, David O., <i>Financial News, 11, Abchurch-lane, E.C.</i>
1907		Cromer, The Rt. Hon. The Earl of, O.M., G.C.B., G.C.M.G., K.C.S.I., 36, <i>Wimpole-street, W.</i>
1904		Crotch, W. Walter, 79, <i>Earlham-road, Norwich.</i>
1883	<i>c d</i>	Cunningham, The Venble. Archdeacon, D.D., 2, <i>St. Paul's-road, Cambridge.</i>
1879	<i>d</i>	Curtis, Robert L., F.S.I., J.P., 11—12, <i>Finsbury-square, E.C.</i>

Year of Election		
1910		Dale, Augustus Charles, I.S.O., <i>Braemar Cottage, Maitland, Cape Town.</i>
1900		Dale, Charles E., F.S.A.A., <i>Old Calabar, West Africa.</i>
1888		Dangerfield, Athelstan, F.C.A., <i>56, Cannon-street, E.C.</i>
1898	<i>d</i>	*Danson, Francis C., <i>Tower Buildings, Water-street, Liverpool.</i>
1901	<i>d</i>	Danvers, Ernest, F.R.G.S., <i>475, B. Mitre, Buenos Ayres.</i>
1909		Darton, Oscar, F.C.A., <i>10, Old Jewry Chambers, London, E.C.</i>
1897	<i>d p</i>	*Darwin, Major Leonard, R.E., F.R.G.S., <i>12, Egerton-place, S.W.</i>
1905		Daugherty, Charles M., <i>Bureau of Statistics, Dept. of Agriculture, Washington, D.C., U.S.A.</i>
1901	<i>d</i>	Davar, Sohrab R., M.S.A., <i>53, Esplanade-road, Fort, Bombay.</i>
1901		Davies, Dixon H., <i>Great Central Ry., Marylebone Station, N. W.</i>
1869		Davies, James M., <i>168, St. Vincent-street, Glasgow.</i>
1888		Dawson, G. J. Crosbie, M. Inst. C.E., F.G.S., <i>May-place, Newcastle, Staffs.</i>
1899		Dawson, Miles M., F.A.S., F.I.A., <i>76, William-street, New York, U.S.A.</i>
1903	<i>d</i>	Dawson, Sidney S., F.C.A., F.C.I.S. <i>51, North John-street, Liverpool.</i>
1880		Debenham, Frank, <i>1, Fitzjohn's-avenue, Hampstead, N. W.</i>
1885	<i>d</i>	De Broë, Emile C. De Bichin, <i>Walden Lodge, Carlisle-road, Eastbourne.</i>
1900	<i>d</i>	De la Plaza, Victorino, LL.D. (<i>Buenos Ayres Ry. Co.</i>), <i>Poste Restante, Buenos Ayres.</i>
1907		Denman, Hon. Richard D., <i>9, Swan-walk, Chelsea, S. W.</i>
1891		Denne, William, <i>Lancaster Villa, Beltinge, Herne Bay.</i>
1873		Dent, Edward, <i>2, Carlos-place, Grosvenor-square, W.</i>
1887		Dent, George M., <i>20, Park-avenue, Southport.</i>
1889		De Rothschild, Leopold, D.L., <i>5, Hamilton-place, Piccadilly, W.</i>
1892		De Smidt, Henry, C.M.G., <i>Norham House, Belvedere-rd., Claremont, S.A.</i>
1909		De Than, M. Albin, <i>21, St. James's-street, S. W.</i>
1906		De Vine, John M., <i>Royal National Hospital for Consumption, Ventnor, Isle of Wight.</i>

Year of Election.		
1892		Dewar, William N., <i>c/o The Colonial Mutual Life Assurance Soc., Ltd., 33, Poultry, E.C.</i>
1900		Dewsnup, Professor Ernest R., M.A., F.R.G.S., <i>University of Illinois, Urbana, Ill., U.S.A.</i>
1906	<i>d</i>	*Dick, Godfrey W., A.I.A.N., <i>197, Stamford Hill-road, Durban, Natal.</i>
1908		Dickson, Professor Henry N., M.A., D.Sc., F.R.S.E., <i>The Lawn, Upper Redlands-road, Reading.</i>
1903		Digby, W. Pollard, <i>28, Victoria-street, S.W.</i>
1866	<i>c d p</i>	*DILKE, THE RIGHT HON. SIR CHARLES W., BART., M.P. (<i>Hon. Vice-President</i>), <i>76, Sloane-st., S.W.</i>
1899	<i>d</i>	Dougharty, Harold, A.I.A., F.C.I.S., <i>91, Gleneagle-road, Streatham, S.W.</i>
1894	<i>c d p</i>	Drage, Geoffrey, M.A., <i>29, Cadogan-square, S.W.</i>
1908		Drake, E. T., <i>Government Statist of Victoria, Melbourne.</i>
1897	<i>c d p</i>	DUDFIELD, REGINALD, M.A., M.B., <i>19, Blomfield-road, Maida Vale, W.</i>
1895	<i>c</i>	Dudley, The Right Hon. The Earl of, <i>c/o John Tryon, Esq., 1, New-square, Lincoln's Inn, W.C.</i>
1909		Duffell, James H., A.I.A., <i>Royal London Mutual In. Soc., Ltd., Royal London House, Finsbury-sq., E.C.</i>
1902	<i>c d</i>	DUNBAR, SIR WILLIAM C., BART., C.B., <i>8, Onslow-square, S.W.</i>
1908		Dungey, Miss M. E., <i>Glendower, Clinton-road, Redruth, Cornwall.</i>
1878	<i>c</i>	*Dunraven, The Right Hon. the Earl of, K.P., C.M.G., <i>Kenry House, Putney Vale, S.W.</i>
1910		*Duveen, Edward J., <i>Gangmoor, Hampstead Heath, N.W.</i>
1904		Dymant, Arthur F., <i>Rowantree House, Winchmore Hill.</i>
1888	<i>d</i>	Eckersley, J. C., M.A., F.R.G.S., <i>Carlton Manor, Yeadon, Leeds.</i>
1883	<i>c d p</i>	Edgeworth, Prof. Francis Y., M.A., F.B.A., <i>All Souls', Oxford.</i>
1896	<i>p</i>	Edwards, C. Lewis, F.S.A.A., <i>Great Northern Railway, King's Cross, N.</i>

Year of
Election.

1907	<i>d</i>	Elderton, William Palin, F.I.A., 74, <i>Mount Nod-road, Streatham, S.W.</i>
1908		Eldridge, Ernest E. B., A.I.A., <i>National General Insurance Co., Ltd., King's House, King-street, E.C.</i>
1908	<i>d</i>	Ellinger, Barnard, <i>Ashleigh, Buxton.</i>
1885	<i>c d p</i>	Elliott, Sir Thomas H., K.C.B., <i>Board of Agriculture and Fisheries, 4, Whitehall-place, S.W.</i>
1885		Elliott, William, <i>Southern Life Office, Cape Town.</i>
1889	<i>d</i>	Erhardt, William, 61 ¹ , <i>Bismarckstr : Charlottenburg-Berlin.</i>
1896		Everett, Percy W., <i>Oaklands, Elstree, Herts.</i>
1877	<i>c d p</i>	EVERSLEY, THE RIGHT HON. LORD (<i>Hon. Vice-President</i>), 18, <i>Bryanston-square, W.</i>
1892		Faber, Harald, <i>Fiona, Lennard-road, Penge, S.E.</i>
1910		Fabini, Herman Victor, " <i>Woodchester</i> ," <i>Stanthorpe-rd., Streatham, S.W.</i>
1905		Falk, Oswald T., B.A., F.I.A., 52, <i>Holland Park-avenue, W.</i>
1889	<i>d</i>	Farnworth, Edward J., F.S.A.A., 26, <i>Winckley-square, Preston.</i>
1900	<i>d</i>	Farrer, The Right Hon. Lord, <i>Abinger Hall, Dorking.</i>
1890		Faulks, Joseph E., B.A., F.I.A 187, <i>Fleet-street, E.C.</i>
1893		*Fawcett, Mrs. M. G., 2, <i>Gower-street, W.C.</i>
1882		Fell, Arthur, M.A., M.P., 46, <i>Queen Victoria-street, E.C.</i>
1894		Fellows, Rowland H., F.I.A., 41, <i>Montrose-avenue, Kilburn, N.W.</i>
1889		*Finlay, Major Alexander, <i>The Manor House, Little Brickhill, Bletchley.</i>
1900	<i>d</i>	Fisher, Professor Irving, Ph.D., <i>Yale University, New Haven, Conn., U.S.A.</i>
1888		Fisher, Sir Walter N., F.C.A., 4, <i>Waterloo-street, Birmingham.</i>
1885		*Fitz-Gerald, Lt.-Col. Wm. G., M.A., F.R.Hist.S.,

Year of Election.		
1900	<i>d</i>	Fleming, Owen, Assoc. R.I.B.A., 3, <i>Warwick House-street, Charing Cross, S.W.</i>
1893	<i>c d p</i>	*FLUX, ALFRED W., M.A., <i>Board of Trade, Gwydyr House, Whitehall, S.W.</i>
1882		Foley, Patrick J., <i>Pearl Insurance Company, Adelaide-place, London Bridge, E.C.</i>
1889	<i>d</i>	Foot, Alfred, <i>Melbury, Foxley-lane, Purley, Surrey.</i>
1893		Fortune, David, J.P. <i>Scottish Legal Life Assurance Society, 84, Wilson-street, Glasgow.</i>
1901		Foster, Harry S., D.L., <i>Grosvenor Mansions, 82, Victoria-street, S.W.</i>
1897	<i>c</i>	FOUNTAIN, H., <i>Board of Trade, Whitehall-gardens, S.W.</i>
1878	<i>c d</i>	Foxwell, Professor H. Somerton, M.A., F.B.A. 1, <i>Harvey-road, Cambridge.</i>
1894		Francis, Joseph, 10, <i>Finsbury-square, E.C.</i>
1887		Frankland, Frederick W., F.I.A., "Okataina," <i>Foxton, Manawatu, N. Zealand.</i>
1899		Franklin, Arthur E., 23, <i>Pembridge-gardens, W.</i>
1903	<i>d</i>	Fraser, Malcolm A. C., <i>Government Statistician, Perth, W. Australia.</i>
1902		Fremantle, Professor Henry E. S., <i>University of South Africa, Cape Town</i>
1905		Frings, Francis A.,
1886		Fuller, George P., <i>Neston-park, Corsham, Wilts.</i>
1878		Fuller, William P., <i>Stone Lodge, Cheam, Surrey.</i>
1908		Furniss, Henry S., M.A., 20, <i>Merton-street, Oxford.</i>
1902		Gait, Edward A., I.C.S., C.I.E., <i>Census Commissioner for India, Simla, India.</i>
1852		Galsworthy, Sir Edwin H., J.P., 26, <i>Sussex-place, Regent's-park, N.W.</i>
1860	<i>c d p</i>	Galton, Sir Francis, F.R.S., D.C.L., D.Sc., 42, <i>Rutland-gate, S.W.</i>
1887	<i>d</i>	Garcke, Emile, <i>Electrical Federation Office, Kingsway, W.C.</i>

Year of Election.		
1909		Gaskell, Thomas Penn, M.I.C.E., <i>Townshend House, North-gate, Regent's-park, N.W.</i>
1904		*Gates, Chasemore P., <i>c/o Anglo-Chilian Nitrate and Railway Company, Tocopilla, Chile.</i>
1880		*Gates, John B., A.C.A., 1 and 2, <i>The Exchange, Southwark, S.E</i>
1899	d	Gelling, Benjamin R., <i>Mutual Life Assn. of Australasia, Sydney, N.S. W.</i>
1907		Gemmill, William, F.I.A., <i>P.O. Box 809, Johannesburg, S. Africa.</i>
1909		Ghosh, Devendra Nath., B.A., <i>Deputy Superintendent, Commercial Intell. Dept., 5, Clive-st., Calcutta.</i>
1885		Gibb, Sir George S., <i>Underground Electric Ry. Co., Electric Ry. House, Broadway, Westminster, S.W.</i>
1877		Gilbert, William H. S., 70, <i>Queen-street, Cheapside, E.C.</i>
1900		Gladwell, Sydney W., 59, <i>Palace-street, Victoria-street, S.W.</i>
1860	c d p	Glover, Sir John, J.P., <i>Highgate Lodge, West-hill, Highgate, N.</i>
1901	d	Godfrey, Ernest H., <i>Census and Statistics Office, Dept. of Agriculture, Ottawa, Canada.</i>
1903		Goldman, Leopold, A.I.A., F.C.A., <i>N. American Life Assurance Co., 112-118, King-st. West, Toronto.</i>
1897	c d p	Gomme, George L., F.S.A., <i>London County Council, Spring-gardens, S.W.</i>
1884	d	*Gonner, Professor Edward C. K., M.A., <i>University College, Liverpool.</i>
1901		*Gooch, Henry C., 17, <i>Orford-square, W.</i>
1900	d	Goodsir, George, <i>c/o Messrs. Weddell & Co., 16, St. Helen's-pl., E.C.</i>
1892		Goodwin, Alfred, M.A., 2, <i>Charles-road, St. Leonards, Sussex.</i>
1899		Gordon, Charles H. F., <i>Pitlurg, Beacon Hill, Hindhead, Surrey.</i>
1908		Gough, George W., B.A., 57, <i>Kenilworth-avenue, Wimbledon, S.W.</i>
1887		Gover, Frederic F., 10, <i>Lee-park, Blackheath, S.E.</i>
1893		*Gray, The Hon. James McL., M.A., F.R.G.S., <i>c/o R. Todd, 1, York-buildings, Adelphi, W.C.</i>
1904		*Gray, Robert K., 106, <i>Cannon-street, E.C.</i>
1895	d	Green, John L., 2, <i>Belmont-park, Lee, S.E.</i>
1902		Green, Walford D., M.A., <i>High Garth, Balcombe, Sussex.</i>
1909	d	*Greenwood, Major, M.R.C.S., L.R.C.P., <i>"Reigate," Lower Park-road, Loughton, Essex.</i>

Year of Election.		
1895		Gretton, John, M.P., <i>Stapleford Park, Melton-Mowbray.</i>
1905		Gubbay, M. M. Simeon, B.A., <i>Dept. of Commerce & Industry, Government of India, Calcutta.</i>
1878		Guthrie, Charles, F.C.A., <i>c/o London Bank of Australia, Collins-street, Melbourne.</i>
1880		*Gwynne, James E. A., J.P., F.S.A., <i>Folkington Manor, Polegate, Sussex.</i>
1887		Gwyther, John H., <i>13, Lancaster-gate, W.</i>
1892	<i>d</i>	Hadfield, Sir Robert A., <i>Parkhead House, Sheffield.</i>
1873	<i>d</i>	*Haggard, Frederick T., <i>1, Broadwater Down, Tunbridge Wells.</i>
1903		*Haig, Edric W., M.A., LL.M., <i>Gatehampton, Goring, Oxon.</i>
1887		Haldeman, Donald C., <i>The Rookery, Downe, Kent.</i>
1897	<i>d</i>	Hall, Thomas, <i>Railway Commissioners' Offices, Sydney, N.S.W.</i>
1878		Hallett, Thomas G. P., M.A., <i>Claverton Lodge, Bath.</i>
1903		Hamilton, Charles J., M.A., <i>88, Twyford-avenue, Acton Hill, W.</i>
1873	<i>c d p</i>	HAMILTON, THE RT. HON. LD. GEORGE F., G.C.S.I. <i>(President), 17, Montagu-street, Portman-sq., W.</i>
1884		*Hammersley, Hugh G., <i>The Grove, Hampstead, N.W.</i>
1875		Hankey, Ernest A., <i>Notton, Lacock, Chippenham.</i>
1906		Hannon, Patrick J. H., <i>Clifton Club, Clifton, Bristol.</i>
1876		Hansard, Luke, <i>68, Lombard-street, E.C.</i>
1886		*Hardcastle, Basil W., <i>10, Gainsborough-gardens, Hampstead, N.W.</i>
1901	<i>c d p</i>	HARPER, EDGAR J., <i>County Hall, Spring-gardens, S.W.</i>
1906		*Harper, Roberts, F.R.G.S., F.R. Met. Soc., <i>2, High Elms, Woodford Green.</i>
1893		Harrap, Thomas, <i>143, Stamford-street, Ashton-under-Lyne, Lancs.</i>

Year of Election.		
1868		Harris, David, <i>Lyncombe Rise, Prior Park-road, Bath.</i>
1897		Harris, Walter F., F.I.C.A., <i>13, Westbourne-avenue, Hull.</i>
1882	d p	Harris, William J., <i>Halwill Manor, Beaworthy, R.S.O., N. Devon.</i>
1909		Harrison, C. W. Francis, F.R.G.S., <i>26, Victoria-street, S.W.</i>
1890		Hart, Sir Robert, Bart., G.C.M.G., <i>38, Cadogan-place, S.W.</i>
1900	p	Hartley, Edwin L., B.A., <i>1, Paper-buildings, Temple, E.C.</i>
1910		Hart-Synnot, R.V.O., D.S.O., B.Sc. (Lond.), <i>Ridgmount, Shinfield-road, Reading.</i>
1910		Haslewood, Bernard, Colonial Secretary's Department, <i>Maritzburg, Natal.</i>
1910		Haw, George, <i>Derwell Cottages, 180, Hampstead Way, N.W.</i>
1896		Hawkins, Willoughby R., <i>Bute Docks, Cardiff.</i>
1897		Hayakawa, S., <i>69, Nagatacho-Nichome, Tokio, Japan.</i>
1895	d	Haynes, Thomas H., <i>1, Endsleigh-terrace, Tavistock.</i>
1909		Heath, John St. George C., <i>Woodbrooke, Selby Oak, near Birmingham.</i>
1896		*Heaton-Armstrong, William C., J.P., <i>30, Portland-place, W.</i>
1908		Heinicke, Fedor, <i>Calle Victoria 618, Buenos Ayres, Argentina.</i>
1889		*Hemming, Arthur G., F.I.A., London Assurance Corporation, 7, Royal Exchange, E.C.
1906		Heron, David, M.A., Galton Eugenics Laboratory, <i>University College, Gower-street, W.C.</i>
1890	d	Hewins, W. A. S., M.A., <i>15, Chartfield-avenue, Putney Hill, S.W.</i>
1886		Hibbert, Sir Henry F., <i>8, Park-road, Chorley, Lancashire.</i>
1892	c d p	*Higgs, Henry, LL.B., C.B., <i>The Treasury, Whitehall, S.W.</i>
1878		*Hill, Frederick M., <i>1, The Terrace, Camden-square, N.W.</i>
1904		Hill, William E., <i>Kenneth-chambers, Dogpole-court, Shrewsbury.</i>
1900		Hillingdon, The Right Hon. Lord, <i>67, Lombard-street, E.C.</i>
1906		Hind, Robert, J.P., <i>Editor, "The Journal," Grahamstown, S. Africa.</i>
1910		Hirst, Francis Wrigley, <i>3, Arundel-street, Strand, W.C.</i>

Year of Election.		
1903		Hiscock, Elias J., 51, <i>Sotheby-road, Highbury, N.</i>
1909		Hobson, Charles Kenneth, <i>The Gables, Mount Pleasant, Cambridge.</i>
1904		Hobson, John A., <i>Elmstead, Limpsfield, Surrey.</i>
1908	d	Hoffman, Frederick L., <i>Prudential Insurance Co., Newark, N.J., U.S.A.</i>
1895		Holland, Hon. Liouel R., 75, <i>Eaton-square, S.W.</i>
1898		Holland, Robert M., 68, <i>Lombard-street, E.C.</i>
1901		Holmes, Richard H., J.P. (Alderman), 10, <i>Royal Arcade, Newcastle-on-Tyne.</i>
1891	d	Hooker, Sir Joseph D., G.C.S.I., F.R.S., &c., <i>The Camp, Summingdale.</i>
1895	d p	*Hooker, R. H., M.A., <i>Campden House-chambers, Sheffield-terrace, W.</i>
1906	d	Hooper, Frederick, <i>Board of Trade, 73, Basinghall-street, E.C.</i>
1904		Hooper, Frederick T., <i>Ferneleigh, St. Mark's Avenue, Leeds.</i>
1879		Hooper, George N., <i>Elmleigh, Hayne-road, Beckenham, Kent.</i>
1903	d	Hooper, William G., F.R.A.S. 40, <i>Portland-road, Edgbaston, Birmingham.</i>
1878	c d p	Hooper, Wynnard, 13, <i>Summer-place, Onslow-square, S.W.</i>
1910		Hope, E. W., M.D., L.R.C.P., <i>Public Health Dept.</i> <i>Municipal Offices, Liverpool.</i>
1887		Hopkins, John, <i>Little Boundes, Southborough, Kent.</i>
1899	d	Hopkins, J. Castell, 90, <i>Wellington-street West, Toronto, Canada.</i>
1902	d	Hopwood, Sir Francis J. S., K.C.B., K.C.M.G., <i>Colonial Office, S.W.</i>
1909	d	Hore, C. F. Adair, <i>Local Government Board, S.W.</i>
1890		Howarth, William, 72, <i>Endicell-road, Brockley, S.E.</i>
1883		Howell, Francis B., <i>Ethy, Lostwithiel, Cornwall.</i>
1897	p	Howell, Price, <i>Killara, near Sydney, N.S.W.</i>
1874	c d p	HUMPHREYS, NOEL A., I.S.O. (Vice-President), <i>Ravenhurst, Hook-road, Surbiton.</i>
1903		Hunt, Arthur L., "Bryn," <i>Somerville-road, Sutton Coalfield.</i>
1883		Hunt, Richard A., A.I.A. (Wesleyan & Gen. Ass. <i>Society), Steelhouse-lane, Birmingham.</i>

Year of Election.		
1903		Hunter, Arthur, <i>New York Life Ass. Co.</i> , 346, <i>Broadway, New York, U.S.A.</i>
1888		Hunter, Alderman G. B., D.Sc., <i>Wallsend-on-Tyne.</i>
1902	d p	Hutchins, Miss B. L., <i>The Glade, Branch-hill, Hampstead-heath, N.W.</i>
1888		Hyde, Sir Clarendon G., <i>75, Gloucester-terrace, Hyde-park, W.</i>
1901		Hyde, Hugh V., <i>Board of Trade, 21, St. James's-square, S.W.</i>
1893	d	Hyde, Hon. John, F.R.G.S., F.S.A. Scot., <i>130, Queen's Gate, S.W.</i>
1874	d p	*Ingall, William T. F. M., <i>Invermark, Limpsfield, Surrey.</i>
1903		Innes, Alfred M., <i>British Embassy, Washington, D.C., U.S.A.</i>
1887		Irvine, S. W. D'Arcy, J.P., <i>Equitable Life Assurance Soc. of U.S.A.</i> , c/o <i>Morning Post Building, 346, Strand, W.C.</i>
1907		Irvine, William J., <i>94, De Beauvoir-road, De Beauvoir Town, N.</i>
1910		Jack, Henry J., <i>65, Warwick-road, Kensington, W.</i>
1902		Jagger, John W., <i>Cape Town.</i>
1906		James, A. F. Brodie, <i>Gresham House, Old Broad-street, E.C.</i>
1894	d	Jamieson, George, C.M.G., <i>180, St. James'-court, Euckingham Gate, S.W.</i>
1908		Janisch, Noel, <i>Colonial Secretary's Office, Cape Town, S. Africa.</i>
1872	c d p	Janson, Frederick H., F.L.S., <i>8, Fourth-avenue, Hove.</i>

Year of Election.		
1897	<i>d</i>	Jay, E. A. Hastings, <i>Tower House, Woolwich.</i>
1881		*Jersey, The Right Hon. the Earl of, G.C.B., <i>Osterley-park, Isleworth.</i>
1907	<i>d</i>	*Jevons, H. Stanley, M.A., B.Sc., <i>Woodhill, Rhinubeina, near Cardiff.</i>
1881		Johnson, E. Eltham, <i>110, Cannon-street, E.C.</i>
1910		Johnson, E. Stewart, <i>The Hospital for Sick Children,</i> <i>Great Ormond-street, W.C.</i>
1891	<i>d</i>	Johnson, George, <i>28, Locket-road, Wealdstone.</i>
1905		Jones, John H., <i>The University, Liverpool.</i>
1877		Jones, Theodore B., <i>70, Gracechurch-street, E.C.</i>
1888	<i>d</i>	*Jordan, William L., <i>Royal Societies Club, St. James's-street, S.W.</i>
1889		Justican, Edwin, F.I.A., <i>St. Mildred's House, Poultry, E.C.; and Royal Societies Club, St. James's-street, S.W.</i>
1910		*Kahn, Stephane, F.R.G.S., <i>8, Shelley-court, Tite-street, Chelsea, S.W.</i>
1902		Kains-Jackson, Charles P. C., <i>10, The Green, Richmond.</i>
1885		Keen, William B., <i>23, Queen Victoria-street, E.C.</i>
1884		Kelly, Edward F., <i>182—184, High Holborn, W.C.</i>
1883	<i>c d</i>	Keltie, John Scott, F.R.G.S., LL.D., <i>30, Campden House Chambers, Campden-hill, W.</i>
1878		Kennedy, J. Murray, <i>New University Club, St. James's-street, S.W.</i>
1901		*Kennedy, Pitt, <i>The Royal Colonial Institute, North-</i> <i>umberland-avenue, W.C.</i>
1898		Kent, Arthur C., <i>176, Victoria-street, S.W.</i>
1909		Ker, William P., <i>H.B.M. Legation, Peking, China.</i>
1909		Kerr, Dr. James, M.A., <i>Educational Offices, Victoria Embankment, W.C.</i>

Year of Election.		
1899		Kershaw, John B. C., F.I.C., <i>West Lancs. Laboratory, Waterloo, Liverpool.</i>
1905		Keshishian, Agazar, <i>30, Church-street, New York, U.S.A.</i>
1909		Kettle, Bernard, <i>Guildhall, E.C. (Representing the Library Committee of the Corporation of the City of London).</i>
1909		Keynes, John M., M.A., <i>King's College, Cambridge.</i>
1883	d	*Keynes, John N., M.A., D.Sc., <i>6, Harvey-road, Cambridge.</i>
1906		Khras, Minocher J. S., <i>Khras Bungalow, Middle Colaba, Bombay.</i>
1884		Kimber, Sir Henry, Bart., M.P., <i>79, Lombard-street, E.C.</i>
1898	c d	*KING, A. W. WATERLOW, J.P., <i>Orchard House, Gt. Smith-st., Westminster, S. W.</i>
1883	p	*King, Bolton, M.A., <i>Arden Lodge, Warwick.</i>
1894		*Kirkcaldy, William M., <i>Dunedin, Otago, New Zealand.</i>
1909	d	Kirkham-Hogbin, P. J., c/o <i>Medical Officer of Health, Maison Dieu House, Dover.</i>
1889		Kloetgen, W. J. H., <i>20-21, Lawrence-lane, E.C.</i>
1906	d	Knibbs, George H., <i>Commonwealth Statistician, Melbourne, Victoria.</i>
1878	d	*Kusaka, Yoshio, <i>First National Bank, Tokio, Japan.</i>
1901	d	Lakin-Smith, Herbert, F.C.A., <i>26, Waterloo-street, Birmingham.</i>
1902	p	Lark, Albert E., F.C.A., <i>Hall Quay Chambers, 2, South Quay, Great Yarmouth.</i>
1885	d	Latham, Baldwin, M.Inst. C.E., <i>Parliament-mansions, Victoria-street, S. W.</i>
1910		Laughton, A. M., <i>Government Statist, Melbourne, Victoria.</i>
1897	d	*Lawrence, Frederick W., M.A., <i>87, Clement's-inn, W.C.</i>
1890	d	Lawson, William R., <i>Finchley Lodge, North Finchley, N.</i>

Year of Election.		
1908		Layton, Walter T., <i>Caius College, Cambridge.</i>
1883	<i>d</i>	*Leadam, Isaac S., M.A., 1, <i>The Cloisters, Temple, E.C.</i>
1905	<i>d</i>	*Leake, Percy D., 25, <i>Abchurch-lane, E.C.</i>
1879		*Leete, Joseph, <i>Eversden, South Norwood-park, S.E.</i>
1887		Leitch, Alexander (<i>Scottish Provident Institution</i>), 3, <i>Lombard-street, E.C.</i>
1907		Lempfert, R. G. K., M.A., <i>Meteorological Office, 63, Victoria-street, S.W.</i>
1892		Leon, Herbert S., <i>Bletchley-park, Bletchley, Bucks.</i>
1905		Leonhardt, F. von, 23. <i>Austin Friars, E.C.</i>
1888		*Le Poer-Trench, Col. The Hon. W., R.E., J.P., <i>St. Hubert's, Gerrard's-cross, R.S.O., Bucks.</i>
1887		*Le Roy-Lewis, Lieut.-Colonel Herman, D.S.O., <i>Westbury House, Petersfield, Hants.</i>
1899		L'Estrange, Charles J.,
1898		Leveaux, Arthur M., A.I.A., <i>Registry of Friendly Societies</i> , 28, <i>Abingdon-st., Westminster, S.W.</i>
1908		*Lever, William H., <i>The Hill, Hampstead Heath, N.W.</i>
1903	<i>d</i>	Levy, Professor Hermann, <i>Kussmaulstr. 10, Heidelberg, Germany.</i>
1908		Lewis, Hugh (<i>L'pool, London & Globe Insurance Co.</i>), 1, <i>Cornhill, E.C.</i>
1862	<i>d</i>	Lewis, Robert, 1, <i>Bartholomew-lane, E.C.</i>
1888		*Liberty, A. Lasenby, <i>The Manor House, The Lee, near Gt. Missenden.</i>
1902	<i>d</i>	Litchfield, Frederick, 35, <i>Hampstead Way, Hendon, N.W.</i>
1898		Litkie, Valerian A., 39, <i>South-street, W.</i>
1892		Llewelyn, Sir John T. D., Bart., <i>Penllergaer, Swansea.</i>
1903		*Lloyd, Godfrey I. H., <i>The University of Toronto, Canada.</i>
1888	<i>c d p</i>	Loch, Professor Charles S., D.C.L., <i>Drylaw Hatch, Oxshott, Leatherhead.</i>
1882	<i>c d p</i>	*Longstaff, George B., M.A., M.D., F.R.C.P., <i>Highlands, Putney Heath, S.W.</i>
1907	<i>d</i>	Lord, Samuel, A.S.A.A., 18, <i>Lynton-road, Acton, W.</i>
1876		*Lornie, John G., J.P. (<i>of Birnam & Pitcastle</i>), <i>Rosemount, Kirkcaldy, N.B.</i>

Year of Election.		
1886		*Low, Malcolm, 22, <i>Roland-gardens, S.W.</i>
1909		*Lubbock, The Hon. Harold Fox Pitt, <i>High Elms, Orpington, Kent.</i>
1903		Lunge, Ernest, LL.D., 2, <i>Plowden-building, Temple, E.C.</i>
1908		Lupton, William, <i>Ruskin Press, Stafford-street, Birmingham</i>
1904	d	Lutterveld, Willeim M. J. van, <i>Schiedamsche Singel, Rotterdam, Holland.</i>
1905		Lynch, William H., <i>Highfield, Loom-lane, Radlett.</i>
1875		*Mabson, Richard R., " <i>Statist</i> " <i>Office, 51, Cannon-street, E.C.</i>
1894		Macaulay, Thomas B., <i>Sun Life Assurance Co., Montreal, Canada.</i>
1888		McCankie, James, 129A, <i>George-street, Edinburgh.</i>
1903		MacConochie, William P., <i>Glengariff, New Barnet.</i>
1902		Macdonald, John H., 47, <i>Parliament-street, Westminster, S.W.</i>
1897		MacDonald, Mrs. M. E., 3, <i>Lincoln's Inn Fields, W.C.</i>
1898		*Macdonald, Robert A., <i>Royal Bank of Scotland, Edinburgh.</i>
1872	c d p	Macdonell, Sir John, C.B., LL.D., <i>Room 183, Royal Courts of Justice, W.C.</i>
1873		*McEwen, Laurence T., c/o. <i>R. A. McLean, 1, Queen Victoria-st., E.C.</i>
1905		Macgregor, D. H., M.A., <i>The University, Leeds.</i>
1900		Mackay, Thomas, <i>Sandwood, Nairn.</i>
1886		*Mackenzie, Colin, F.R.G.S.,
1876		*McLean, Robert A., F.R.G.S., 1, <i>Queen Victoria-street, E.C.</i>
1888	d	McNiel, Henry, 18, <i>Exchange-street, Manchester.</i>

Year of Election.		
1882		MacRosty, Alexander,
1904		Macrosty, Henry W., B.A., 29, <i>Hervey-road, Blackheath, S.E.</i>
1899		*MacWharrie, Niel M., <i>Conservative Club, St. James's, S.W.</i>
1906	d	Magnus, Sir Philip, M.P., 16, <i>Gloucester-terrace, Hyde Park, W.</i>
1891		Maidment, Thomas, <i>Insurance Chambers, King's-road, Southsea.</i>
1904	c d p	MALLET, BERNARD (<i>Vice-President</i>), <i>General Register Office, Somerset House, W.C.</i>
1902	d	Mandello, Professor Julius G., Ph.D. <i>Pozsony, Hungary.</i>
1908		Mann, Joseph, <i>Hopedene, Coulsdon, Surrey.</i>
1908		Manohar Lāl, Professor, M.A., <i>Senate House, Calcutta, India.</i>
1884		*Manson, Frederick W., <i>Faircrouch, Wadhurst, Sussex.</i>
1888		Manuel, James, 36, <i>Vittoria-street, Ottawa, Canada.</i>
1910		Marriner, Frederick J. " <i>Lynwood</i> ," <i>Gisborne-road, Hornsey, N.</i>
1880	c d p	*Marshall, Professor Alfred, M.A., <i>Balliol Croft, Madingley-road, Cambridge.</i>
1887		Marshall, W. Bayley, M.I.C.E., M.I.M.E., <i>Imperial Hotel, Malvern.</i>
1872	c d p	*MARTIN, SIR RICHARD BIDDULPH, BART. (<i>Hon. Vice-President and Treasurer</i>), 10, <i>Hill-street, Mayfair, W.</i>
1884		Mason, William A., 31a, <i>Colmore-row, Birmingham.</i>
1898		Massingberd, Captain Stephen, <i>Gunby Hall, Burgh, Lincolnshire.</i>
1875		*Mathers, John S.,
1901		Meakin, George H., A.S.A.A., <i>Town Hall, Islington, N.</i>
1882		Medhurst, John T., F.S.A.A., <i>City of London College, Moorfields, E.C.</i>
1901		Meredith, Hugh O., <i>Hollycroft, Cavendish-avenue, Cambridge.</i>
1884	d	Merton, Zachary, 31, <i>Green-street, Park-lane, W.</i>
1907		Middleton, Professor Thomas H., M.A., 4, <i>Whitehall-place, S.W.</i>
1909		Millard, Percy W., LL.B., 3, <i>St. James's-square, S.W.</i>
1900		Miller, John W., <i>Union Club, S.W.</i>

Year of Election.		
1889		*Mills, Major Henry Farnsby,
1892	c d	Milner, The Rt. Hon. Viscount, G.C.B., G.C.M.G., 47, <i>Duke-street, S. W.</i>
1882	p	Milnes, Alfred, M.A., 44, <i>Goldhurst-terrace, S. Hampstead, N. W.</i>
1907		*Mitchell, Frederick W., <i>Star Life Assurance Soc., 32, Moorgate-st., E. C.</i>
1902	u	Molesworth, Sir Guilford L., K.C.I.E., <i>The Manor House, Bexley, Kent.</i>
1899		*Moon, Edward R. P., 6, <i>Onslow Gardens, W.</i>
1887		Moore, Arthur C., 23, <i>Essex-street, Strand, W. C.</i>
1874		Moore, Charles R., 43, <i>Breakspears-road, St. Johns, S. E.</i>
1885		Moore, Harold E., F.S.I., <i>Oaklands, Beckenham.</i>
1878		*Moore, John B. G., <i>Loymount, Cookstown, Ireland.</i>
1903		Moores, George, 9, <i>Beaufort-avenue, West Didsbury, Manchester</i>
1909	d	Morgan, Ben. H., <i>Caxton House, Westminster, S. W.</i>
1910		Morgan, H. Allan, <i>Holmwood, Knutsford, Cheshire.</i>
1893	d	Morgan, Percy C., <i>Queen Anne's Chambers, S. W.</i>
1909		Morison, Hector McDonald, A.C.A., <i>Oakwood, Park Hill-road, Croydon.</i>
1902	c	MORISON, SIR THEODORE, M.A., K.C.I.E., <i>Ashleigh, St. George's-road, Wrybridge.</i>
1909		Morris, R. Denman, 10, <i>Carlingford-road, Hampstead, N. W.</i>
1891	c d p	Morrison, Rev. William D., LL.D., <i>The Rectory,</i> <i>Marylebone Church, Marylebone-road, N. W.</i>
1904	d	Mosely, Alfred, C.M.G., <i>West Lodge, Hadley Wood, Barnet.</i>
1885		*Mosley, Touman, <i>Bangors, Iver, Uxbridge.</i>
1886	c	Mowbray, Sir Robert G. C., Bart., 90, <i>Piccadilly, W.</i>
1886	d	Moxon, Thomas B., <i>Lancs. and Yorks. Bank, King-st., Manchester.</i>
1904		Mudie-Smith, Richard, 9, <i>Clifton-villas, Maida Vale, W.</i>
1883		Muirhead, Henry J., <i>Fairfield, Hythe, Kent; and Reform Club, S. W.</i>
1899	d	Muirhead, James M. P., J.P., F.R.S.E., F.R.S.L., F.S.A.A., F.C.I.S., F.R.C.I., <i>Box 1161, 57, St. George's-street, Cape Town.</i>

Year of Election.		
1905		Muller, Oswald V., M.A., <i>Elphinstone College, Bombay; and Newquay, Cornwall.</i>
1891	<i>c d</i>	MURPHY, SIR SHIRLEY F., F.R.C.S., <i>9, Bentinck-terrace, Regent's-park, N.W.</i>
1909		Nathan, Eric Barrett, A.I.A., <i>99, Portsdown-road, W.</i>
1878		*Nathan, Henry,
1907		Nathan, Sir Nathaniel, K.C., <i>Queen's House, St. James's Court, S.W.</i>
1908		Neill, Samuel B., <i>13a, Canton-road, Shanghai, China.</i>
1908		Neill, Thomas, London, Edinburgh, and Glasgow <i>Assurance Co., Ltd., Euston Square, N.W.</i>
1869	<i>c d p</i>	Neison, Francis G. P., F.I.A., <i>93, Adelaide-road, South Hampstead, N.W.</i>
1877		Nevill, C. Henry, <i>1 and 2, Great Winchester-street, E.C.</i>
1905		Nevill, Henry R., <i>Allahabad, U.P., India.</i>
1900		Newcomb, Harry T., LL.M., <i>Bethesda, Montgomery County, Md., U.S.A.</i>
1889	<i>c d p</i>	NEWSHOLME, ARTHUR, M.D., <i>57, Northgate, Regent's-park, N.W.</i>
1895		*Nicholson, Charles N., M.P., <i>35, Harrington-gardens, South Kensington, S.W.</i>
1878	<i>d p</i>	Nicholson, Professor J. Shield, M.A., D.Sc., F.B.A., <i>University of Edinburgh.</i>
1858	<i>d</i>	Nightingale, Miss Florence, O.M., <i>10, South-street, Park-lane, W.</i>
1871		*Noble, Benjamin, F.R.A.S., <i>Westmorland House, Low Fell, Gateshead.</i>
1889		Northampton, The Most Hon. the Marquess of, <i>51, Lennox-gardens, S.W.</i>

Year of Election.		
1888		Oakley, Sir Henry, 37, <i>Chester-terrace, Regent's-park, N.W.</i>
1886	<i>d</i>	O'Connor, James E., C.I.E., 144, <i>Church-road, Upper Norwood, S.E.</i>
1901		Offen, Charles R. W., <i>Bloomsbury House, Cartwright-gardens, W.C.</i>
1885	<i>d</i>	*Oldham, John (<i>River Plate Telegraph Co.</i>), 287, <i>San Martin, Buenos Ayres.</i>
1909		O'Malley, L.S.S., I.C.S., <i>United Service Club, Calcutta, India.</i>
1892	<i>c p</i>	ONSLow, THE RIGHT HON. THE EARL OF, G.C.M.G. (<i>Hon. Vice-President</i>), 7, <i>Richmond-terrace, Whitehall, S.W.</i>
1878		Oppenheim, Henry, 16, <i>Bruton-street, Bond-street, W.</i>
1899		Ormsby, John Y., c/o Burnett, Ormsby Clapp & Co., 7, <i>Melinda-street, Toronto.</i>
1909		Osborne, James Henry, F.R.G.S., <i>Knoyle House, Ealing, W.</i>
1887	<i>d</i>	*Page, Edward D., <i>Oakland, Bergen County, N.J., U.S.A.</i>
1899	<i>c d p</i>	Paish, George, "Statist" Office, 51, <i>Cannon-street, E.C.</i>
1866	<i>c d p</i>	*Palgrave, Sir R. H. Inglis, F.R.S., <i>Henstead Hall, Wrentham, Suffolk.</i>
1906		Parish, Walter Woodbine, 9, <i>Courtfield-road, S.W.</i>
1878		Park, David F., C.A., F.F.A., A.I.A., 39, <i>Lombard-street, E.C.</i>
1908		Parker, Charles Sandbach, <i>Demerara-buildings, St. Dunstan's-hill, E.C.</i>
1903		Parker, Sir Gilbert, M.P., 20, <i>Carlton House-terrace, S.W.</i>
1891		Parker-Smith, The Rt. Hon. James, 20, <i>Draycott-place, S.W.</i>
1883		Paterson, John, 1, <i>Walbrook, E.C.</i>
1910		Pattin, H. Cooper, M.A., M.D. (Cam.) <i>Municipal-buildings, Norwich.</i>
1888		Pattullo, James Durie, 65, <i>London Wall, E.C.</i>

Year of Election		
1878	<i>d</i>	Paulin, Sir David, 6, <i>Forres-street, Edinburgh.</i>
1893	<i>d</i>	Payne, Alexander W., F.C.A., 70, <i>Finsbury-pavement, E.C.</i>
1884		*Peace, Sir Walter, K.C.M.G., I.S.O., 83, <i>Victoria-street, Westminster, S. W.</i>
1910		Peacock, Walter, 3, <i>Buckingham-gate, S. W.</i>
1909		Pearce, A. James, A.C.A., <i>Corn Exchange Chambers, Princes-st., Ipswich.</i>
1895		Peixotto, M. Percy (<i>U.S. Equitable Life Office</i>), 36, <i>Avenue de l'Opéra, Paris.</i>
1903		Pekelharing, Dr. G., 11, <i>Zeemansstraat, Rotterdam.</i>
1891	<i>d</i>	Penn-Lewis, William, "Cartref," <i>Toller-road, Leicester.</i>
1892		*Pentland, The Right Hon. Lord, 2, <i>Cambridge-square, W.</i>
1906		Perkins, Herbert H. W.,
1902	<i>d</i>	Peters, Edward T., <i>Bureau of Statistics, Dept. of Agriculture, Washington, D.C., U.S.A.</i>
1890		Peters, John W., 5, <i>King's-road, Southsea.</i>
1886		Peto, Sir Henry, Bart., M.A., <i>Chedington Court, Misterton, Crewkerne.</i>
1887	<i>d</i>	Phelps, Lieut.-General Arthur, 23, <i>Augustus-road, Edgbaston, Birmingham.</i>
1908	<i>d</i>	Phelps, E. Bunnell, M.A., " <i>The American Underwriter</i> ," 141, <i>Broadway, New York City, U.S.A.</i>
1886	<i>d</i>	*Phelps, Rev. Lancelot R., M.A., <i>Oriel College, Oxford.</i>
1900	<i>d</i>	*Pigou, Professor Arthur C., M.A., <i>King's College, Cambridge.</i>
1904		Pilling, John A., <i>c/o Messrs. Deloitte and Co., Florida 77, Buenos Ayres.</i>
1878	<i>d</i>	*Pim, Joseph Todhunter, <i>Rinnamara, Monkstown, Co. Dublin.</i>
1903		Pirrie, The Right Hon. Lord, K.P., LL.D., <i>Downshire House, Belgrave-square, S. W.</i>
1881		Planck, Deputy Surgeon-General Charles, M.R.C.S., <i>Lyden Croft, Edenbridge, Kent.</i>
1902		Plant, Alfred T., <i>Accountant's Office, G. W. R., Paddington, W.</i>
1895	<i>d</i>	Platt-Higgins, Frederick, <i>Woodham-place, Horsell, Woking.</i>
1901		Plender, William (<i>c/o Messrs. Deloitte and Co.</i>), 5, <i>London Wall-buildings, Finsbury-circus, E.C.</i>
1861	<i>c d</i>	Plowden, Sir William C., K.C.S.I., 5, <i>Park-crescent, Portland-place, W.</i>

Year of Election		
1905		Pocock, Bernard G., A.S.A.A., 197, <i>High Holborn, W.C.</i>
1896		*Pontifex, Bryan, A.C.A., <i>Imperial Bank-buildings, Toronto, Canada.</i>
1891		Potter, Henry, <i>Normanhurst, Grosvenor-rd., West-cliffe-on-Sea, Essex.</i>
1879	c d p	*POWELL, SIR FRANCIS S., BART., (<i>Honorary Vice-President</i>), 1, <i>Cambridge-sq., Hyde-park, W.</i>
1877		*Prance, Reginald H., <i>Frognaal, Hampstead, N.W.</i>
1867		*Pratt, Robert L., 13, <i>Danesbury-terrace, Darlington.</i>
1896		Pretyman, Captain Ernest G., M.P., <i>Orwell-park, Ipswich.</i>
1887	c d p	*PRICE, L. L., M.A., <i>Oriel College, Oxford.</i>
1909		Pritchard, Arthur, M.A., 3, <i>Temple-gardens, Temple, E.C.</i>
1887	c d p	PROBYN, SIR LESLEY, K.C.V.O. (<i>Vice-President</i>), 79, <i>Onslow-square, S.W.</i>
1889		Probyn, Lieut.-Colonel Clifford, 55, <i>Grosvenor-street, Grosvenor-square, W.</i>
1886	d	Provand, Andrew D., 2, <i>Whitehall-court, S.W.</i>
1896		Pryor, Edward T., 23, <i>Fore-street, E.C.</i>
1901		Quin, Stewart B., F.C.A., 16, <i>Donegall-square South, Belfast.</i>
1883		Rabidge, Richard, F.C.A., 32, <i>Poultry, E.C.</i>
1872	d p	*Rabino, Joseph, <i>The Godwins, Christchurch-park, Sutton.</i>
1858		*Radstock, The Right Hon. Lord, <i>Mayfield, Woolston, Southampton.</i>

Year of Election.		
1885	c d	Rae, John, M.A., 1, <i>Rockland-road, Putney, S. W.</i>
1887	d p	Raffalovich, His Excellency Arthur, 19, <i>Avenue Hoche, Paris.</i>
1909		Raghunatha Rao, C. S. (<i>Agricultural Research Institute</i>), <i>Pusa, Bengal, India.</i>
1880	c	Rankin, Sir James, Bart., M.P., <i>Bryngwyn, Hereford.</i>
1897		Ranson, Albert, <i>Tavern-street, Ipswich.</i>
1903		Rathbone, Miss Eleanor F., <i>Green Bank, Liverpool, E.</i>
1874	c d p	*Ravenstein, Ernest G., F.R.G.S., 2, <i>York-mansions, Battersea-park, S. W.</i>
1877		*Rawlins, Thomas, 45, <i>King William-street, E.C.</i>
1893		Rea, Charles H. E., F.R.A.S., A.I.A., " <i>Holmesdale</i> ," <i>South Darenth, Kent.</i>
1910		Rea, Peter Mackenzie, <i>Merton House, Salisbury-sq., Fleet-street, E.C.</i>
1908		Reade, Herbert Vincent, 32, <i>Palace Gardens-terrace, Kensington, W.</i>
1889		*Reed, Thomas, F.C.A., 63, <i>King-street, South Shields.</i>
1908		Reid, George T., B.Sc., 30, <i>Southwold-mansions, Elgin-avenue, W.</i>
1906	d	Rennie, James Stuart M., <i>Tangong Pagar Docks, Singapore, Straits Settlement.</i>
1888	c d p	REW, R. H. (<i>Hon. and Hon. Foreign Sec.</i>), <i>Board of Agriculture & Fisheries, 3, St. James's-square, S. W.</i>
1888		Rhodes, George W., 131, <i>Wool Exchange, Coleman Street, E.C.</i>
1895		Richards, Roger C., <i>Cader House, Foxley-lane, Purley.</i>
1909		Ridley, Rt. Hon. Viscount, 10, <i>Carlton House-terrace, S. W.</i>
1903		Ripon, The Right Rev. the Lord Bishop of, <i>The Palace, Ripon.</i>
1892		Rivington, Francis H., 44, <i>Connaught-square, W.</i>
1882		Roberts, Edward, I.S.O., F.R.A.S., <i>Park Lodge, Court-road, Eltham.</i>
1894	d p	Robertson, J. Barr, 10, <i>Walbrook, E.C.</i>
1900		Robinson, James, 10, <i>Alma-place, North Shields.</i>
1904		Rogers, Arthur G. L., M.A., <i>Board of Agriculture, &c., 4, Whitehall-place, S. W.</i>
1880		*Ronald, Byron L., 14, <i>Upper Phillimore-gardens, W.</i>

Year of Election.		
1873	c	*Rosebery, The Rt. Hon. the Earl of, K.G., K.T., F.R.S., 38, <i>Berkeley-square, W.</i>
1904	c d p	ROSENBAUM, SIMON, M.Sc., 94, <i>Barrow Gate-road, Chiswick, W.</i>
1892	d	Ross, C. Edmonstone, F.S.A.A., <i>Examiner of Accounts, P. W. D. Rangoon, India.</i>
1904		Routly, William H., F.S.A.A., <i>Borough Treasurer, Folkestone.</i>
1899	d	Rowntree, B. Seebohm, 32, <i>St. Mary's, York & The Homestead, Clifton, York.</i>
1898	d p	Rozenraad, Cornelius, 4, <i>Moreton-gardens, South Kensington, S. W.</i>
1890		Ruffer, Marc A., C.M.G., M.A., M.D., B.Sc. <i>Ramleh, Egypt.</i>
1903		Runciman, Rt. Hon. Walter, M.P., <i>Doxford, Chathill, Northumberland.</i>
1888	d	Rusher, Edward A., F.I.A., 142, <i>Holborn Bars, E. C.</i>
1886		Russell, Arthur B., F.C.A., <i>Marlborough House, 11, Ludgate-hill, E. C.</i>
1878	d	Russell, Richard F., 160, <i>Milfort-road, Thornton Heath, Croydon.</i>
1907	d	Rutter, Frank R., Ph.D., <i>Bureau of Statistics,</i> <i>Dept. of Agriculture, Washington, D. C., U. S. A.</i>
1907		Rye, Reginald A., <i>Goldsmiths' Librarian,</i> <i>University of London, South Kensington, S. W.</i>
1894	d	Sachs, Edwin O., 10A, <i>Waterloo-place, Pall Mall, S. W.</i>
1909		*Sale, Charles V., 40, <i>Threadneedle-street, E. C.</i>
1898	d	Salmon, Richard G., F.I.A., <i>Oakdale House, Oakdale-road, Streatham, S. W.</i>
1875	d	*Salomons, Sir David L., Bart., J.P., <i>Broom-hill, Tunbridge Wells.</i>
1908	d	Samnel, George A. II., <i>Morden House, Cutford.</i>
1899	d	Sanderson, Frank, M.A., <i>Canada Life Ass. Co., Toronto, Canada.</i>
1895	c	SANGER, CHARLES P., M.A., 58, <i>Oakley-street, Chelsea, S. W.</i>
1891		*Sarda, Pandit Har Bilas, B.A., M.R.A.S., <i>Government College, Ajmere, India</i>

Year of Election.		
1886	<i>d p</i>	Sanerbeck, Augustus, <i>Messrs. H. Schwartz & Co., 3 & 4, Moorgate-street-buildings, E.C.</i>
1887		*Scarth, Leveson, M.A., 84, <i>Oakwood-court, Kensington, W.</i>
1902		Schindler, Walter, <i>c/o Gebr.-Sulzer, Winterthur, Switzerland.</i>
1904		*Schlesinger, Louis G., 12A, <i>Avenida Sur 16B, Guatemala.</i>
1891	<i>d p</i>	*Schloss, David F., M.A., 18, <i>Hornton Court, Kensington, W.</i>
1908	<i>d</i>	Schmidt, Arno, 22, <i>St. Mary's-gate, Manchester.</i>
1895		Schmidt, Hermann, 36A, <i>Amphill-square, N.W.</i>
1891	<i>d p</i>	Schooling, J. Holt, <i>Fotheringhay Hse., Montpelier-row, Twickenham.</i>
1908		Schumpeter, Dr. Joseph A., <i>University of Czernovitz, Czernovitz, Austria.</i>
1895	<i>d</i>	Schuurman, Willem H. A. Elink, <i>Godelindeweg, 10, Hilversum, Holland.</i>
1883		*Schwam, John F., <i>Oakfield, Wimbledon, S.W.</i>
1888		Scotter, Sir Charles, Bart., <i>Surbiton.</i>
1880		*Seeley, Sir Charles, Bart., <i>Sherwood Lodge, Nottingham.</i>
1905		Sellar, Alexander S., M.A., <i>c/o George King, Esq., 15, Wallbrook, E.C.</i>
1899		Setchfield, George B., <i>Beulah Kop, 3, Clarkson-street, Sheffield.</i>
1886	<i>d p</i>	Seyd, Ernest J. F., 38, <i>Lombard-street, E.C.</i>
1905	<i>d</i>	Seyd, Richard E. N. J., 38, <i>Lombard-street, E.C.</i>
1908		Shakir Ali, Mahomed, <i>Barrister-at-Law,</i> <i>Basti, United Provinces, India.</i>
1909		Sharp, Clifford Dyce, <i>Woodside Corner, Erskine-hill, Hendon, N.W.</i>
1898	<i>c d p</i>	SHAW, WILLIAM N., D.Sc., F.R.S., 10, <i>Moreton-gardens, South Kensington, S.W.</i>
1907		Sheffield, The Right Hon. Lord, 18, <i>Mansfield-street, W.</i>
1898	<i>d</i>	Sherwell, Arthur, 102-3, <i>Bedford Court-mansions, W.C.</i>
1888		Shillcock, Joshua, M.A., <i>Bank of England, Burlington-gardens, W.</i>
1907		Shimmell, James E., A.I.A., <i>c/o British Legal Life</i> <i>Assurance Co., Ltd., 78, New Oxford-st., W.</i>
1904	<i>c</i>	Sim, J. D. Stuart, <i>Reg. of Friendly Societies, 28, Abingdon-st., S.W.</i>

Year of Election.		
1907	<i>d</i>	Simon, André L., 24, <i>Mark-lane, E.C.</i>
1902		Sinclair, H. D., 19 and 20, <i>Silver-street, Wood-street, E.C.</i>
1906		Smith, Charles, 11, <i>Winter-street, Sheffield.</i>
1878	<i>d</i>	*Smith, George, LL.D., C.I.E., 10, <i>South Learmouth-gardens, Edinburgh.</i>
1889	<i>d</i>	Smith, G. Armitage, M.A., D.Sc., 3, <i>Albert-terrace, Regent's-park, N.W.</i>
1904		*Smith, H. B. Lees, M.A., M.P. <i>Latimer House, Church-street, Chiswick, W.</i>
1906		Smith, Horace A. <i>Bureau of Statistics, Sydney, N.S.W.</i>
1877		Smith, Howard S., F.C.A., A.I.A., F.F.A., <i>Bank Chambers, 14, Waterloo-street, Birmingham.</i>
1888	<i>c d</i>	Smith, Sir H. Llewellyn, K.C.B., B.Sc., <i>Oakfield Lodge, Ashted.</i>
1901		Smith, Robert J., C.A., 163, <i>West George-street, Glasgow.</i>
1905		Smith, Stanley G., 131, <i>Muswell-avenue, Muswell-hill, N.</i>
1894		*Smith, The Hon. William F. D., M.P., 3, <i>Grosvenor-place, S.W.</i>
1908		Smith, William H., F.S.A.A., 70, <i>Sunny Bank, Hull.</i>
1894		Smithers, Frederick O., 171, <i>Adelaide-road, South Hampstead, N.W.</i>
1910		Snow, Ernest Charles, <i>Sir John Cass's Institute, Jewry-street, E.C.</i>
1900	<i>c p</i>	*SOMERVILLE, PROFESSOR WILLIAM, M.A., D.Sc., 121, <i>Banbury-road, Oxford.</i>
1899		Sorley, James, F.I.A., F.F.A., F.R.S.E., 82, <i>Onslow-gardens, S.W.</i>
1904		Souter, John, <i>c/o Mines Department, P.O. Box 1132,</i> <i>Johannesburg.</i>
1897		Southgate, Henry W., 29, <i>Hamilton-avenue, Chapletown, Leeds.</i>
1895		Soward, Alfred W., 28, <i>Therapia-road, Honor Oak, S.E.</i>
1855	<i>d</i>	Sowray, J. Russell, "Fairlawn," <i>Teston, Maidstone.</i>
1904		Sowrey, John W., "Beaconsfield," <i>Devonshire-road, Merton, S.W.</i>
1896		Sparrow, Frederick S., 84, <i>Pitt-street, Sydney, N.S.W.</i>
1906		Spear, Bertram E., <i>Duneira, 277, Willesden-lane, N.W.</i>
1904		Spencer, Frederick H., LL.B., "Elm Grove Cottage," <i>Pinner, Middlesex.</i>

Year of Election.		
1867		*Spencer, Robert J.,
1892		Spender, John A., M.A., 45, <i>Sloane-street, S. W.</i>
1897	d	Spensley, J. Calvert, 3, <i>Prorost-road, S. Hampstead, N. W.</i>
1883		Spicer, Sir Albert, Bart., M.P., 50, <i>Upper Thames-street, E.C.</i>
1898		Spicer, Edward S., <i>Grange Cottage, The Grange, Wimbledon.</i>
1856	d	*Sprague, Thomas B., M.A., LL.D., F.I.A., 29, <i>Buckingham-terrace, Edinburgh.</i>
1882		Stack, Thomas N., 7, <i>Union-court, E.C.</i>
1901		Stallard, Charles F., <i>P.O. Box 5156, Johannesburg.</i>
1902		*Steel-Maitland, Arthur H. D. R., M.P., 72, <i>Cadogan-square, S. W.</i>
1899		Stenberg, Ernst G., <i>Chief Electoral Officer, W. Australia, Perth, W.A.</i>
1882		*Stern, Sir Edward D., 4, <i>Carlton House-terrace, S. W.</i>
1885	d	*Stevens, Marshall, <i>Trafford Park, Manchester.</i>
1903	d	Stevens, William J., "St. Clair," <i>Tyson-road, Forest Hill, S.E.</i>
1908	d p	*Stevenson, Dr. T. H. C., <i>General Register Office, Somerset House, W.C.</i>
1906		*Stock, Edward J., A.I.A., 395, <i>Collins-st., Melbourne, Victoria, Australia.</i>
1889		Stow, Major Harry V., 24, <i>Holborn, E.C.</i>
1883	d	*Strathcona, The Right Hon. Lord, G.C.M.G., 28, <i>Grosvenor-square, W.</i>
1909	d	Streeter, Rev. Theodore E., 312, <i>Atlantic-avenue, Winnipeg, Man., Canada</i>
1884		*Sugden, Richard, <i>The Farre Close, Brighouse, Yorkshire.</i>
1895		Sutherland, J. Francis, M.D., 51, <i>Queen-street, Edinburgh.</i>
1902		Sutton, Martin J., J.P., <i>Holme Park, Sonning, Berks.</i>
1900		Swetenham, Charles C., <i>c/o Grindlay Groom & Co., Bombay, India.</i>
1900	d p	Sykes, John F. J., M.D., D.Sc., 40, <i>Camden-square, N. W.</i>

Year of
Election.

1889	<i>d</i>	Tattersall, William, <i>Melbrook, Bowdon, Cheshire.</i>
1905		Taylor, William B., B.A., LL.B., 112-118, <i>King-street West, Toronto.</i>
1893		Teece, Richard, F.I.A., F.F.A., <i>Actuary, A.M.P. Society, Sydney, N.S.W.</i>
1888	<i>d</i>	Temperley, William A., junr., 2, <i>St. Nicholas-buildings, Newcastle-on-Tyne.</i>
1888		Theobald, John W., 8, <i>Fairfield-road, Croydon.</i>
1888	<i>c d p</i>	Thomas, David A., M.A., M.P., <i>Llanvorn, near Newport, Mon.</i>
1905		Thomas, P. Scofield, 220, <i>Croydon-road, Anerley, S.E.</i>
1864		*Thompson, Henry Y., 19, <i>Portman-square, W.</i>
1909		Thompson, John W., F.F.A., A.I.A., <i>Glencarn, Cockenzie, N.B.</i>
1901	<i>d p</i>	Thompson, Robert J., <i>Board of Agriculture, &c.,</i> 8, <i>Whitehall-place, S.W.</i>
1889	<i>d</i>	Touche, George A., <i>Broomfield, Westcott, near Dorking.</i>
1868		*Treatt, Frank B., <i>Court House, Cowra, New South Wales.</i>
1868		Tritton, Joseph H., 54, <i>Lombard-street, E.C.</i>
1903	<i>d</i>	Trivett, John B., <i>Bureau of Statistics, Sydney, N.S.W.</i>
1885		Turner, William, <i>c/o The Librarian,</i> <i>Free Public Library, Trinity-street, Cardiff.</i>
1909		Turnor, Christopher, <i>Panton Hall, Wragby, Lincolnshire.</i>
1892	<i>d</i>	Tyler, Edgar A., 9, <i>Old Jewry Chambers, E.C.</i>
1903		Unstead, John F., M.A., F.R.G.S., 39, <i>Greenholm-road, Eltham Park, S.E.</i>

Year of
Election.

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| 1903 | | *Vaizey, Ker G. R.,
10, <i>Line-street, E.C.</i> |
| 1888 | | Van Raalte, Marcus,
22, <i>Austin Friars, E.C.</i> |
| 1889 | | *Venning, Charles H., <i>Local Government Mutual Guarantee Soc., Ltd., Lambert House, 10 & 12, Ludgate-hill, E.C.</i> |
| 1894 | | Verney, Frederick W., M.P.,
<i>Botolph House, Winslow, Bucks.</i> |
| 1909 | | Verney, Harry, B.Sc., B. Comm. LL.B.,
12, <i>St. Mary's-place, Bury, Lancs., and Home Office, London, S.W.</i> |
| 1886 | c | Verulam, The Right Hon. the Earl of,
<i>Gorhambury, St. Albans.</i> |
| 1905 | | Vigor, Harold D.,
196, <i>Mackenzie-road, Beckenham, Kent.</i> |
| 1885 | | Vincent, Frederick J., A.I.A., <i>London, Edinburgh and Glasgow Assurance Co., Ltd., Euston Square, N.W.</i> |
| 1904 | | Vinter, James O., J.P.,
<i>Southfield, Trumpington, Cambs.</i> |
| | | |
| 1902 | | Wacha, Dinsha Edulji,
84, <i>Hornby-road, Fort, Bombay.</i> |
| 1905 | | Wadia, N. P. N., M.S.A.A.,
105, <i>Adelaide-road, N.W.</i> |
| 1904 | | Wagner, H. R.,
165, <i>Broadway, New York, U.S.A.</i> |
| 1900 | | Walford, Adolphus A. B. (<i>Frank Brown & Co.</i>),
<i>Finkle Chambers, Stockton-on-Tees.</i> |
| 1890 | d | Walford, Ernest L.,
47, <i>Hamilton-terrace, N.W.</i> |
| 1909 | | Walker, James,
5, <i>Fielden Drive, Partick, Glasgow.</i> |

Year of Election		
1906		Walker, William T., A.C.A., 6A, <i>Austin Friars, E.C.</i>
1904	d	Wall, Walter W., 4, <i>Bradgate-road, Catford, S.E.</i>
1905		Wallis, B. Cotterell, F.C.P., B.Sc. (Econ.), 27A, <i>Sedgemere-avenue, East Finchley, N.</i>
1868		Wallis, Charles J., <i>Woodcroft, Battle, Sussex.</i>
1880	d	Wallis, E. White, <i>Cannons-lane, Pinner, Middlesex.</i>
1908	d	Wallis, Percy, <i>Westacre, Kettering.</i>
1904		*Walsh, Correa M., <i>Bellport, Long Island, New York, U.S.A.</i>
1910		Walsh, Robert, F.C.A., 67, <i>High-street, Belfast.</i>
1893		Ward, William C., F.S.I.A., 113, <i>Pitt-street, Sydney, N.S.W.</i>
1888		Warren, Reginald A., J.P., <i>Preston-place, near Worthing.</i>
1865		Waterhouse, Edwin, A.I.A., F.C.A., 3, <i>Frederick-place, Old Jewry, E.C.</i>
1886	p	Waters, Alfred C., <i>General Register Office, Somerset House, W.C.</i>
1892		Wates, Charles M., 4, <i>Garden-road, Bromley, Kent.</i>
1902	d	Watson, Alfred W., F.I.A., <i>St. Stephen's House, Victoria Embankment, S.W.</i>
1910		*Watt, James, F.F.A., 24, <i>Rothesay-terrace, Edinburgh.</i>
1908		Webb, Augustus D., B.Sc., 5, <i>St. George's-avenue, Tufnell Park, N.</i>
1888		Webb, Henry B., <i>Holmdale, Dorking.</i>
1904	d	Webb, The Hon. Mr. Montagu de Pomeroy, C.I.E., <i>Karachi, India.</i>
1893	d	Weedon, Thornhill, <i>Govt. Statistician, Bryn-Mawr, Brisbane.</i>
1873	c	*Welby, The Right Hon. Lord, G.C.B., 11, <i>Stratton-street, Piccadilly, W.</i>
1889		*Wells-Smith, Henry, F.C.A., " <i>Hillcrest</i> ," <i>Blyth-grove, Worksop, Notts.</i>
1855	c d p	WELTON, THOMAS A., F.C.A., <i>Ixworth Court, Stanhope-road, Highgate, N.</i>
1902	d	Westall, George, 87, <i>Chancery-lane, W.C.</i>
1879		*Westlake, John, K.C., LL.D., <i>The River House, 3, Chelsea Embankment, S.W.</i>
1882		*Whadcoat, John H., F.C.A., <i>Rockcliffe, Kirkcudbrightshire.</i>

Year of Election		
1878		Wharton, James, <i>Edgehill, Netherhall-gds., Fitzjohn's-av., N. W.</i>
1887		Whinney, Frederick, <i>85, Avenue-road, Regent's Park, N. W.</i>
1859		Whitbread, Samuel, <i>Southill-park, Biggleswade, Beds.</i>
1887		*White, The Rev. George C., M.A., <i>Nursling Rectory, Southampton.</i>
1905		White, Richard, F.C.I.S., <i>Folkestone Chamber of Commerce, Folkestone.</i>
1910		Whitehead, Alfred North, F.R.S., <i>17, Carlyle-square, S. W.</i>
1888	d	Whitehead, Sir James, Bart., J.P., D.L., <i>Wilmington Manor, near Dartford.</i>
1895	d	Whitehead, The Hon. Thomas Henderson, M.L.C., <i>Chartered Bank of India, &c., Hong Kong.</i>
1892	c d	Whitelegge, B. Arthur, C.B., M.D., <i>12, St. Mary Abbot's-terrace,, Kensington, W.</i>
1895		Whittuck, Edward A., M.A., B.C.L., <i>Claverton Manor, Bath.</i>
1899		Wiener, Isidore, <i>Colecroft, Kenley, Surrey.</i>
1898		Wigham, Matthew T., A.S.A.A., F.C.I.S., <i>826, Salisbury House, London Wall, E.C.</i>
1909		Wilbur, Dr. Cressy L., Chief Statistician, <i>Bureau of the Census, Washington, D.C., U.S.A.</i>
1901	d	Willcox, Walter F., Ph.D., <i>Cornell University, Ithaca, N. Y., U.S.A.</i>
1896		*Williams, Major C. Woolmer, <i>28, Prebend-mansions, High-road, Chiswick, W.</i>
1897	d	*Williams, Ernest E., <i>Ecclefechan, Lake-road, Wimbeldon, S. W.</i>
1904		Williams, Frederick A., A.I.A., F.A.S., <i>Apartado 1420, Mexico City, Mexico D.F.</i>
1864		Williams, F. Bessant, F.S.A. (Scot.), 3, <i>Essex-grove, Central Hill, Upper Norwood, S.E.</i>
1907	d	Williams, J. P. C. C., Ph.D., M.R.A.S., M.S.A., <i>103, Clive-street, Calcutta, India.</i>
1888		*Williams, Robert, M.P., <i>20, Birchin-lane, E.C.</i>
1909		Williams, Sydney Fairs, <i>4. South-street, Finsbury, E.C.</i>
1895		*Willis, J. G., B.A., <i>Board of Trade, Whitehall-gardens, S. W.</i>
1891		Wilson, Henry J., M.P., <i>Osgathorpe Hills, Sheffield.</i>
1898		Wilson, Herbert W., <i>203, Elgin-avenue, W.</i>
1884		Wilson, The Hon. Sir James, K.C.S.I., <i>Ochilview, Crieff, N.B.</i>

Year of Election		
1906		Wilson, Walter, 3, <i>East-parade, Leeds.</i>
1909		Wolfe, Lee J., 161, <i>Broadway, New York, U.S.A.</i>
1900	d	Wolfe, S. Herbert, 165, <i>Broadway, New York City, U.S.A.</i>
1899	c p	WOLVERHAMPTON, RT. HON. VISCOUNT, G.C.S.I. (<i>Hon. Vice-President</i>), <i>Reform Club, Pall Mall, S.W.</i>
1897	d p	Wood, George H., <i>Caerleon Ho., Oakfield-rd., Birkby, Huddersfield.</i>
1897		Woodd, Basil A. H., 59, <i>Drayton-gardens, S.W.</i>
1902		Woodhouse, Lister, A.C.A., <i>Westminster City Hall, Charing Cross-rd., W.C.</i>
1908		Woodward, James H., 137, <i>Gillott-road, Edgbaston, Birmingham.</i>
1890		*Woolcombe, Robert L., LL.D., &c., 14, <i>Waterloo-road, Dublin.</i>
1903		Woolley, Ernest, 7, <i>Finch-lane, Cornhill, E.C.</i>
1895		Worsfold, Edward M., F.C.A., <i>Market Square, Dover.</i>
1878		Worsfold, Rev. John N., M.A., <i>Hathelsey, 17, Alexandra-road, Worthing.</i>
1906		Wyldbore-Smith, Edmund C., H.M. Vice-Censul, <i>British Legation, Tangier, Morecco.</i>
1868	c d p	YERBURGH, ROBERT A., M.P. 25, <i>Kensington Gore, S.W.</i>
1900		Yerbury, John E., 3, <i>Queen-street, Cheapside, E.C.</i>
1888		*Yglesias, Miguel, 2, <i>Tokenhouse-buildings, E.C.</i>
1877		*Youll, John G., <i>Jesmond-road, Newcastle-on-Tyne.</i>
1909		Young, Arthur Stanley, F.I.A., H.H. <i>The Nizam's</i> <i>Serrice, Hyderabad, Deccan, India.</i>
1908		Young, Charles W. F., M.D., <i>Middlesex Guildhall, Westminster, S.W.</i>
1898		Young, Sydney, <i>The Corn Exchange, Mark-lane, E.C.</i>
1895	c d p	YULE, G. UDNY (<i>Hon. Secretary</i>), 28, <i>Great Ormond-street, W.C.</i>

Year of Election.	
1901	Zimmerman, Lawrence W., 282, Dickenson-road, Rusholme, Manchester.

* * * *The Honorary Secretaries request that any inaccuracy in the foregoing list, and all changes of address, may be notified to the*
ASSISTANT SECRETARY.

HONORARY FELLOWS.

HIS MOST GRACIOUS MAJESTY THE KING,
Patron.

Argentine Republic.

Year of
 Election.
 1890

- d* FRANCISCO LATZINA, **Calle Maipu, 982, Buenos Ayres.**
 Director General of Statistics; Doctor *honoris causâ* of the Faculty of Physical and Mathematical Sciences of the University of Córdoba; Knight of the Italian Order of S.S. Maurice and Lazare; Officer of the Academy of France; Member of the National Academy of Sciences, of the International Statistical Institute, of the Geographical and Statistical Societies of Paris, of the Society of Commercial Geography of Paris, and Corresponding Member of the National Historical Academy of Venezuela.

Belgium.

- 1904 *d* EMILE WAXWEILER, **Pare Leopold, Brussels.**
 Honorary Engineer of Roads and Bridges; Director of the Sociological Institute, Brussels; Professor of Economics and Finance at the University of Brussels; Superintendent of Statistical Section of Labour Department; Member of the International Statistical Institute.

Denmark.

- 1878 *d* VIGAND ANDREAS FALBE-HANSEN, **Copenhagen.**
 Late Director of the Statistical Bureau of the State; late Professor of Political Economy at the University of Copenhagen; Director of the Life and Fire Office "Danmark"; *Doctor Juris.*
- 1900 *d p* MARCUS RUBIN, **Vendersgade 25a, Copenhagen.**
 Knight of the Order of the "Danebrog"; Director-General of Customs and Taxation; late Director of the Statistical Bureau of the State; President of the Danish Society of Political Economy and of the Board of the Danish Society of History; Member of the International Statistical Institute.
- 1907 *d p* HARALD LUDVIG WESTERGAARD, **Scherfigsvej, Copenhagen.**
 Professor of Statistics at the University of Copenhagen.

Year of
Election*France.*

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| 1880 | <i>d p</i> | JACQUES BERTILLON, M.D., 1, Avenue Victoria, Paris.
Chief of the Statistical Department of the City of Paris; Member of the Superior Council of Statistics; of the Consultative Committee of Public Hygiene of France; Past President of the Statistical Society of Paris; and Member of the International Statistical Institute, &c. |
| 1879 | <i>d</i> | ARTHUR CHERVIN, M.D., 82, Avenue Victor Hugo, Paris.
Doctor of Medicine and Surgery; Director of the Paris Institute for Stammerers; Vice-President of the Statistical Society of Paris; Member of the Superior Institute, &c. |
| 1890 | <i>d p</i> | ALFRED DE FOVILLE, 30, Rue Bellechase, Paris.
Late Master of the Mint; Councillor of the Court of Accounts; Officer of the Legion of Honour; Member of the Institute of France; Past President of the Statistical Society of Paris; Member of the International Statistical Institute and of the Superior Council of Statistics. |
| 1908 | <i>d p</i> | YVES GUYOT, 95, Rue de Seine, Paris.
Member of the "Conseil Supérieur de Statistique"; Ex-President of the Statistical Society of Paris; Ex-Minister of Public Works; Guy Medallist; Hon. Member of the Cobden Club &c. |
| 1860 | <i>d p</i> | PIERRE ÉMILE LEVASSEUR, Collège de France, Paris.
Member of the Institute of France; Professor at the College of France and at the Conservatoire of Arts and Trades; President of the Statistical Commission for Primary Instruction; Past President of the Statistical Society of Paris; Vice-President of the International Statistical Institute, of the Superior Council of Statistics, and of the Society of Political Economy, &c. |
| 1910 | <i>d</i> | M. EUGÈNE TISSERAND, 17, Rue de Cirque, Paris.
Ex-Councillor of State; ex-Director of Agriculture; ex-Member of the Superior Council of Statistics; ex-President of the Statistical Society of Paris. |
| 1887 | | DANIEL WILSON, 2, Avenue d'Jéna, Paris.
Ex-Under-Secretary of State; Past President of the Statistical Society of Paris. |
| 1876 | <i>d</i> | THE PRESIDENT (for the time being) OF THE STATISTICAL SOCIETY OF PARIS, 28, Rue Serpente Danton, Paris. |

Germany.

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| 1890 | <i>d</i> | KARL JULIUS EMIL BLENCK, Lindenstrasse, 28, Berlin, S.W.
Wirklicher Geheimer Ober-Regierungsrat; Director of the Royal Statistical Bureau of Prussia, also Member of the Prussian Central Statistical Commission and of the Central Board of Control of the Survey of Prussia; Member of the International Statistical Institute; Honorary Member or Member of several learned Societies. |
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Year of Election		Germany—Contd.	
1896	d	CARL VICTOR BÖHMERT, Hospitalstrasse, 4, Dresden. Geheimer Regierungsrath; Doctor Juris; Late Director of the Statistical Bureau of Saxony; Professor of Political Economy and Statistics in the Polytechnical High School of Dresden; Member of the International Statistical Institute.	
1908	d	RICHARD VAN DER BORGHT, Kaiserl. Statistisches Amt, Berlin. President of the Imperial Statistical Bureau; Organiser of the Census Arrangements of the Empire; President of the Council for Labour Statistics, &c.	
1904	d	DR. WILHELM LEXIS, Göttingen. Professor of Economics and Statistics at the University of Göttingen; Vice-President of the International Statistical Institute.	
1877	d	GEORG VON MAYR, Georgenstrasse, 38, Munich. Ex-Under Secretary of State in the Imperial Ministry for Alsace-Lorraine; formerly Director of the Royal Statistical Bureau of Bavaria; Honorary Member of the International Statistical Institute; Ordinary Professor of Statistics, Finances, and Political Economy at the University of Munich; Associate of the Statistical Society of Paris.	
1897	d	ADOLPH WAGNER, Ph.D., 51, Lessingstrasse, Berlin, N.W. Professor of Political Economy at the University of Berlin; Member of the Statistical Bureau of Prussia, and of the International Statistical Institute.	
1876	d	THE PRESIDENT (for the time being) OF THE GEOGRAPHICAL AND STATISTICAL SOCIETY OF FRANKFORT, Stadtbibliothek, Frankfort.	

Hungary.

1904	d	JULES DE VARGHA, Budapest. Director of the Central Statistical Bureau of Hungary; President of the Commission for the preparation of the annual administration report on Hungary; Member of the International Statistical Institute.	
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Italy.

1874	d	LUIGI BODIO, 153, Via Torino, Rome. Senator; Doctor of Laws; Professor of Industrial Legislation and of Statistics at the Engineering College, Rome; Councillor of State; formerly General Director of the Statistics of the Kingdom; formerly Commissioner-General of Emigration; Member of the International Statistical Institute; Member of the Royal Academy "dei Lincei"; Correspondent of the Institute of France (Academy of Moral and Political Sciences).	
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Year of
Election.
1899

Italy—Contd.

- 1899 *d* **CARLO FRANCESCO FERRARIS, Via 20 settembre, 7, Padua.**
Professor of Administrative Science and Law, and of Statistics at the Royal University of Padua; Member of the Superior Council of Statistics and of the Superior Council of Public Education of Italy; Member of the Academy "dei Lincei," of the Royal Institute of Science at Venice, of the International Statistical Institute, and Honorary Member of the Swiss Statistical Society; Ex-Minister of Public Works; Member of the Italian Parliament.
- 1907 *d* **ENRICO RASERI, M.D., Direzione Generale della Statistica, Rome.**
Chief Director of the Division of Demographic Statistics of the Statistical Department of the Kingdom; Secretary of the "Higher Council of Statistics."

Japan.

- 1910 *d* **COUNT Y. YANAGISAWA, 1, Shiba Yamachi, 8, Chôme, Tokio.**
Member of the House of Peers; Attaché (honorary) to the Bureau of General Statistics; Chief of the Statistical Bureau of the City of Tokio.

Mexico.

- 1895 *d* **DON MANUEL FERNANDEZ LEAL, Casa de Moneda, Mexico City.**
Director of the Mint; Late Secretary of State, Department of "Fomento," Colonization and Industry.

Netherlands.

- 1904 *d* **C. A. VERRIJN STUART, Professor at the University, Groningen, Holland.**
President of the Central Statistical Commission of the Netherlands; Professor of Political Economy and Commercial Law at the Académie Technique, Delft; Late Director of the Central Statistical Bureau of the Netherlands; Member of the Central Commission of Statistics; Corresponding Member of Statistical Society of Paris; Secretary-General of International Statistical Institute.

Norway.

- 1874 *d* **ANDERS NICOLAI KLÆR, Christiania.**
Director of the Central Statistical Bureau of Norway; Associate of the Statistical Society of Paris; Member of the International Statistical Institute.

Year of Election		Russia.	
1873	d	HIS EXCELLENCY PIERRE SEMENOV, St. Petersburg. Senator; Privy Councillor to His Imperial Majesty; President of the Imperial Statistical Council; President of the Imperial Geographical Society; Honorary Member of the Academy of Sciences in St. Petersburg; Associate of the Statistical Society of Paris.	
1890	d	HIS EXCELLENCY NICOLAS TROÏNITSKY, Mohovaia 6, St. Petersburg. Former Governor; Senator; Privy Councillor; late Director of the Central Statistical Committee of the Ministry of the Interior; President of the Statistical Council, Life Member of the Imperial Geographical Society of Russia, Vice-President of the International Statistical Institute, and Member of the Statistical Society of Paris.	

Sweden.

1890	d	ELIS SIDENBLADH., Ph.D., Stockholm. Late Director in Chief of the Central Statistical Bureau of Sweden; Late President of the Royal Statistical Commission; Commander, Officer, and Knight of several Swedish and Foreign Orders; Member of the Royal Academies of Sciences and of Agriculture, at Stockholm, of the International Statistical Institute, and Honorary and Corresponding Member of several foreign learned Societies.	
1909	d	M. Dr. GUSTAV SUNDBÄRG. Professor of Statistics at the University of Upsala, Upsala; Late Superintendent, Central Statistical Bureau of the Kingdom; Actuary; Compiler of the series "Aperçus statistiques internationaux," &c.	

Switzerland.

1890	d	LOUIS GUILLAUME, Bern. Doctor of Medicine; Director of the Federal Statistical Bureau; Secretary of the International Penitentiary Commission; Member of the International Statistical Institute.	
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United States.

1873	d	THE HON. WILLIAM BARNES, The O'Connor-Barnes Homestead, On the Cliff, Nantucket Island, Mass., U.S.A. Lawyer; Ex-Superintendent of the Insurance Department, State of New York.	
1881	d	JOHN SHAW BILLINGS, 425, Lafayette Street, New York City. M.A., M.D., LL.D., Edinburgh and Harvard; D.C.L., Oxon; Surgeon, U.S. Army; Member of the National Academy of Sciences, of the International Statistical Institute, &c.	

Year of Election		United States—Contd.	
1896	<i>d</i>	WORTHINGTON CHAUNCEY FORD, <i>c/o</i> Massachusetts Historical Society, Boston, Mass., U.S.A. Late Chief of the Bureau of Statistics, Treasury Department; Late Chief of the Bureau of Statistics, Department of State; Member of the International Statistical Institute.	
1877	<i>d</i>	EDWARD YOUNG, M.A., Ph.D., 207, Maryland Avenue, N.E., Washington, D.C. Late Consul of the United States; formerly Chief of the Bureau of Statistics, United States of America; Member of the Geographical Society of Paris.	

Dominion of Canada.

1894	<i>d</i>	GEORGE JOHNSON, Grand Pré, Nova Scotia. Late Statistician, Department of Agriculture, Ottawa, Canada.	
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Tasmania.

1894	<i>d</i>	ROBERT MACKENZIE JOHNSTON, I.S.O., Hobart. Registrar-General and Government Statistician; Fellow and Member of Council of the Royal Society of Tasmania; Member of Council and of Senate of the University of Tasmania; Fellow and Past President of Section F (<i>Economics and Statistics</i>) of the Australasian Association for the Advancement of Science; Fellow of the Royal Geographical Society of Australia; Honorary Foreign Corresponding Member of the Geological Society of Edinburgh; Fellow of the Linnean Society of London.	
1876	<i>d p</i>	EDWIN CRADOCK NOWELL, I.S.O., J.P., Hobart. Clerk of Legislative Council of Tasmania; late Government Statistician; Clerk to the Federal Council of Australasia in its seven Sessions.	

Great Britain and Ireland.

1876	<i>d</i>	THE PRESIDENT (for the time being) OF THE MANCHESTER STATISTICAL SOCIETY, 3, York Street, Manchester.	
1876	<i>d</i>	THE PRESIDENT (for the time being) OF THE STATISTICAL AND SOCIAL INQUIRY SOCIETY OF IRELAND, 35, Molesworth Street, Dublin.	

* * * The Honorary Secretaries request that any inaccuracies in the List of HONORARY FELLOWS, and all changes of address, may be notified to the Assistant Secretary.

ROYAL STATISTICAL SOCIETY.

Copy of Charter.

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland Queen, Defender of the Faith.

To all to whom these Presents shall come, Greeting:—

Whereas Our Right trusty and entirely beloved cousin, Henry, Third Marquess of Lansdowne, Knight of the Most Noble Order of the Garter, Charles Babbage, Fellow of the Royal Society, John Elliott Drinkwater, Master of Arts, Henry Hallam, Fellow of the Royal Society, the Reverend Richard Jones, Master of Arts, and others of Our loving subjects, did, in the year One thousand eight hundred and thirty-four, establish a Society to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social, and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method, and the same Society is now called or known by the name of “The “Statistical Society.”

And Whereas it has been represented to Us that the same Society has, since its establishment, sedulously pursued such its proposed objects, and by its publications (including those of its transactions), and by promoting the discussion of legislative and other public measures from the statistical point of view, has greatly contributed to the progress of statistical and economical science.

And Whereas distinguished individuals in foreign countries, as well as many eminent British subjects, have availed themselves of the facilities offered by the same Society for communicating important information largely extending statistical knowledge; and the general interest now felt in Statistics has been greatly promoted and fostered by this Society.

And Whereas the same Society has, in aid of its objects, collected a large and valuable library of scientific works and charts, to which fresh accessions are constantly made; and the said Society has hitherto been supported by annual and other subscriptions and contributions to its funds, and has lately acquired leasehold premises in which the business of the said Society is carried on.

And Whereas in order to secure the property of the said Society, to extend its operations, and to give it its due position among the Scientific Institutions of Our kingdom, We have been besought to grant to Sir Rawson William Rawson, Knight Com-

mander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and to those who now are Members of the said Society, or who shall from time to time be elected Fellows of the Royal Statistical Society hereby incorporated, Our Royal Charter of Incorporation for the purposes aforesaid.

1. **Now Know Ye** that We, being desirous of encouraging a design so laudable and salutary, of Our especial grace, certain knowledge and mere motion, have willed, granted, and declared and Do by these Presents, for Us, Our heirs and successors, will, grant, and declare that the said Sir Rawson William Rawson, Knight Commander of the Most Distinguished Order of St. Michael and St. George, and Companion of the Most Honourable Order of the Bath, and such other of Our loving subjects as now are Members of the said Society, or shall from time to time be elected Fellows of "The Royal Statistical Society" hereby incorporated according to such regulations or bye laws as shall be hereafter framed or enacted, and their successors, shall for ever hereafter be by virtue of these presents one body politic and corporate, by the name of "**The Royal Statistical Society,**" and for the purposes aforesaid, and by the name aforesaid, shall have perpetual succession and a common seal, with full power and authority to alter, vary, break, and renew the same at their discretion, and by the same name to sue and be sued, implead and be impleaded, answer and be answered, unto and in every Court of Us, Our heirs and successors.

2. **The** Royal Statistical Society, in this Charter hereinafter called "The Society," may, notwithstanding the statutes of mortmain, take, purchase, hold and enjoy to them and their successors a hall, or house, and any such messuages or hereditaments of any tenure as may be necessary, for carrying out the purposes of the Society, but so that the yearly value thereof to be computed at the rack rent which might be gotten for the same at the time of the purchase or other acquisition, and including the site of the said hall, or house, do not exceed in the whole the sum of Two thousand pounds.

3. **There** shall be a Council of the Society, and the said Council and General Meetings of the Fellows to be held in accordance with this Our Charter shall, subject to the provisions of this Our Charter, have entire the management and direction of the concerns of the Society.

4. **There** shall be a President, Vice-Presidents, a Treasurer or Treasurers, and a Secretary or Secretaries of the Society. The Council shall consist of the President, Vice-Presidents, and not

less than twenty Councillors; and the Treasurer or Treasurers and the Secretary or Secretaries if honorary.

5. **The** several persons who were elected to be the President, Vice-Presidents, and Members of the Council of the Statistical Society at the Annual Meeting held in the month of June, One thousand eight hundred and eighty-six, shall form the first Council of the Society, and shall continue in office until the first Election of officers is made under these presents as hereinafter provided.

6. **General** Meetings of the Fellows of the Society may be held from time to time, and at least one General Meeting shall be held in each year. Every General Meeting may be adjourned, subject to the provisions of the Bye Laws. The following business may be transacted by a General Meeting, viz.:—

- (a.) The Election of the President, Vice-Presidents, Treasurer or Treasurers, Secretary or Secretaries, and other Members of the Council of the Society.
- (b.) The making, repeal, or amendment of Bye Laws.
- (c.) The passing of any proper resolution respecting the affairs of the Society.

7. **Bye Laws** of the Society may be made for the following purposes, and subject to the following conditions, viz.:—

- (a.) For prescribing the qualification and condition of tenure of office of the President; the number, qualifications, functions, and conditions of tenure of office of the Vice-Presidents, Treasurers, Secretaries, and Members of Council, and Officers of the Society; for making regulations with respect to General Meetings and Meetings of the Council and proceedings thereat, and for the election of any persons to be Honorary Fellows or Associates of the Society, and defining their privileges (but such persons, if elected, shall not be Members of the Corporation), and for making regulations respecting the making, repeal and amendment of Bye Laws, and generally for the government of the Society and the management of its property and affairs.
- (b.) The first Bye Laws shall be made at the first General Meeting to be held under these presents, and shall (amongst other things) prescribe the time for holding the first election of officers under these presents.

8. **The** General Meetings and adjourned General Meetings of the Society shall take place (subject to the rules or bye laws of the Society, and to any power of convening or demanding a

Special General Meeting thereby given) at such times and places as may be fixed by the Council.

9. **The** existing rules of the Statistical Society, so far as not inconsistent with these presents, shall be in force as the Bye Laws of the Society until the first Bye Laws to be made under these presents shall come into operation.

10. **Subject** to these presents and the Bye Laws of the Society for the time being, the Council shall have the sole management of the income, funds, and property of the Society, and may manage and superintend all other affairs of the Society, and appoint and dismiss at their pleasure all salaried and other officers, attendants, and servants as they may think fit, and may do all such things as shall appear to them necessary or expedient for giving effect to the objects of the Society.

11. **The** Council shall once in every year present to a General Meeting a report of the proceedings of the Society, together with a statement of the receipts and expenditure, and of the financial position of the Society, and every Fellow of the Society may, at reasonable times to be fixed by the Council, examine the accounts of the Society.

12. **The** Council may, with the approval of a General Meeting, from time to time appoint fit persons to be Trustees of any part of the real or personal property of the Society, and may make or direct any transfer of such property so placed in trust necessary for the purposes of the trust, or may, at their discretion, take in the corporate name of the Society conveyances or transfers of any property capable of being held in that name. Provided that no sale, mortgage, incumbrance, or other disposition of any hereditaments belonging to the Society shall be made unless with the approval of a General Meeting.

13. **No** Rule, Bye Law, Resolution, or other proceeding shall be made or had by the Society, or any meeting thereof, or by the Council, contrary to the general scope or true intent and meaning of this Our Charter, or the laws or statutes of Our Realm, and anything done contrary to this present clause shall be void.

In witness whereof We have caused these Our Letters to be made Patent.

Witness Ourself, at Westminster, the thirty-first day of January, in the fiftieth year of Our Reign.

By Warrant under the Queen's Sign Manual,

L. S.

MUIR MACKENZIE.

ROYAL STATISTICAL SOCIETY.

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BYE-LAWS OF THE ROYAL STATISTICAL SOCIETY.

Objects of the Society.

1. The objects of the Royal Statistical Society are to collect, arrange, digest and publish facts, illustrating the condition and prospects of society in its material, social and moral relations; these facts being for the most part arranged in tabular forms and in accordance with the principles of the numerical method.

The Society collects new materials, condenses, arranges, and publishes those already existing, whether unpublished or published in diffuse and expensive forms in the English or in any foreign language, and promotes the discussion of legislative and other public measures from the statistical point of view. These discussions form portions of the published Transactions of the Society.

Constitution of the Society.

2. The Society consists of Fellows and Honorary Fellows, elected in the manner hereinafter described.

Number of Fellows and Honorary Fellows.

3. The number of Fellows is unlimited. Foreigners or British subjects of distinction residing out of the United Kingdom may be admitted as Honorary Fellows, of whom the number shall not be more than seventy at any one time.

Proposal of Fellows.

4. Every Candidate for admission as a Fellow of the Society shall be proposed by two or more Fellows, who shall certify from their personal knowledge of him or of his works, that he is a fit person to be admitted a Fellow of the Society. Every such certificate having been read and approved of at a Meeting of the Council, shall be suspended in the office of the Society until the following Ordinary Meeting, at which the vote shall be taken.

Election of Fellows.

5. In the election of Fellows, the votes shall be taken by ballot. No person shall be admitted unless at least sixteen Fellows vote, and unless he

have in his favour three-fourths of the Fellows voting.

Admission of Fellows.

6. Every Fellow elect is required to take the earliest opportunity of presenting himself for admission at an Ordinary Meeting of the Society.

The manner of admission shall be thus:—

Immediately after the reading of the minutes, the Fellow elect, having first paid his subscription for the current year or his composition, shall sign the obligation contained in the Fellowship-book, to the effect following:—

“We, who have underwritten our names, do hereby undertake, each for himself, that we will endeavour to further the good of the Royal Statistical Society for improving Statistical Knowledge, and the ends for which the same has been founded; that we will be present at the Meetings of the Society as often as conveniently we can, and that we will keep and fulfil the Bye-laws and Orders of this Society: provided that whensoever any one of us shall make known, by writing under his hand, to the Secretaries for the time being, that he desires to withdraw from the Society, he shall be free thenceforward from this obligation.”

Whereon the President, taking him by the hand, shall say,—“By the authority, and in the name of the Royal Statistical Society, I do admit you a Fellow thereof.”

Upon their admission Fellows shall have the right of attaching to their names the letters F.S.S., but not in connection with any trading or business advertisement other than the publication of any book or literary notice.

Admission of Honorary Fellows.

7. There shall be Two Meetings of the Society in the year, on such days as shall be hereafter fixed by the Council, at which Honorary Fellows may be elected.

No Honorary Fellow can be recommended for election but by the Council. At any Meeting of the Council any Member thereof may propose a Foreigner or

British subject of distinction residing out of the United Kingdom, delivering at the same time a written statement of the qualifications of, offices held by, and published works of, the person proposed; and ten days' notice at least shall be given to every Member of the Council, of the day on which the Council will vote by ballot on the question whether they will recommend to the Society the election of the person proposed. No such recommendation to the Society shall be adopted unless at least three-fourths of the votes are in favour thereof.

Notice of the recommendation shall be given from the chair at the Meeting of the Society next preceding that at which the vote shall be taken thereon. No person shall be elected an Honorary Fellow unless sixteen Fellows vote and three-fourths of the Fellows voting be in his favour.

The Council shall have power to elect as Honorary Fellows, the Presidents for the time being of the Statistical Societies of Dublin, Manchester, and Paris, and the President of any other Statistical Society at home or abroad.

Payments by Fellows.

8. Every Fellow of the Society shall pay a yearly subscription of Two Guineas, or may at any time compound for his future yearly payments by paying at once the sum of Twenty Guineas,* unless the Annual Subscription or Composition Fee shall be remitted by the Council; provided that the number of Fellows whose Annual Subscription or Composition Fee shall have been thus remitted, do not exceed five at any one time.

Every person elected to the Society shall pay his first subscription (or if he desire to become a Life Fellow, his composition) within three months at the latest of the date of his election, if he be resident in the United Kingdom. If he be resident abroad, this period shall be six months. If payment be not made within the time specified above, the election shall be void.

Defaulters.—Withdrawal of Fellows.

9. All yearly payments are due in

advance on the 1st of January, and any Fellow of the Society have not paid his subscription before the 1st of January, he shall be applied to in writing by the Secretaries, and if the same be not paid before the 1st of January of the second year, a written application shall again be made by the Secretaries, and any Fellow in arrear shall cease to receive the Society's publications, and shall not be entitled to any of the privileges of the Society until such arrears are paid, and if the subscription be not discharged before the 1st of February of the second year, the name of the Fellow thus in arrear shall be exhibited on a card suspended in the office of the Society, and if, at the next Annual General Meeting, the amount still remain unpaid, the defaulter shall, unless otherwise authorised by the Council, be announced to be no longer a Fellow of the Society, the reason for the same being at the same time assigned. No Fellow of the Society can withdraw his name from the Society's books, unless all arrears be paid; and no resignation will be deemed valid unless a written notice thereof be communicated to the Secretaries. No Fellow shall be entitled to vote at any Meeting of the Society until he shall have paid his subscription for the current year.

Expulsion of Fellows.

10. If any Fellow of the Society, or any Honorary Fellow, shall so demean himself that it would be for the dishonour of the Society that he longer continue to be a Fellow or Honorary Fellow thereof, the Council shall take the matter into consideration; and if the majority of the Members of the Council present at some Meeting (of which and of the matter in hand such Fellow or Honorary Fellow, and every Member of the Council, shall have due notice) shall decide by ballot to recommend that such Fellow or Honorary Fellow be expelled from the Society, the President shall at its next Ordinary Meeting announce to the Society the recommendation of the Council, and at the following Meeting the question shall be decided by ballot, and if at least three-fourths of the

* Cheques should be made payable to "The Royal Statistical Society," and crossed "Messrs Drummond and Co."

number voting are in favour of the expulsion, the President shall forthwith cancel the name in the Fellowship-book, and shall say,—

“By the authority and in the name of the Royal Statistical Society, I do declare that A. B. (naming him) is no longer a Fellow (or Honorary Fellow) thereof.”

And such Fellow or Honorary Fellow shall thereupon cease to be of the Society.

Trustees.

11. The property of the Society may be vested in three Trustees, chosen by the Fellows. The Trustees are eligible to any other offices in the Society.

President, Council, and Officers.

12. The Council shall consist of a President and thirty Members, together with the Honorary Vice-Presidents.

From the Council shall be chosen four Vice-Presidents, a Treasurer, the Honorary Secretaries, and a Foreign Secretary, who may be one of the Honorary Secretaries. The former Presidents who are continuing Fellows of the Society shall be Honorary Vice-Presidents. Any five of the Council shall be a quorum.

Election of President and Officers.

13. The President, Members of Council, Treasurer, and Honorary and Foreign Secretaries shall be chosen annually by the Fellows at the Annual General Meeting.

The Vice-Presidents shall be chosen annually from the Council by the President.

The President shall not be eligible for the office more than two years in succession.

Six Fellows, at least, who were not of the Council of the previous year, shall be annually elected; and of the Members retiring three at least shall be those who have served longest continuously on the Council, unless they hold office as Treasurer or Honorary or Foreign Secretary.

Nomination of President, Council, and Officers.

14. The Council shall, previously to the Annual General Meeting, nominate, by ballot, the Fellows whom they recommend to be the next President and

Council of the Society. They shall also recommend for election a Treasurer and the Secretaries (in accordance with Rule 12). Notice shall be sent to every Fellow whose residence is known to be within the limits of the metropolitan post, at least a fortnight before the Annual General Meeting, of the names of Fellows recommended by the Council.

Extraordinary Vacancies.

15. On any extraordinary vacancy occurring of the Office of President, or other Officer of the Society, the Honorary Secretaries shall summon the Council with as little delay as possible, and a majority of the Council, thereupon meeting in their usual place, shall, by ballot, and by a majority of those present, choose a new President, or other Officer of the Society, to be so until the next Annual General Meeting.

Committees.

16. The Council shall have power to appoint Committees of Fellows and also an Executive Committee of their own body. The Committees shall report their proceedings to the Council. No report shall be communicated to the Society except by the Council.

Auditors.

17. At the first Ordinary Meeting of each year, the Fellows shall choose two Fellows, not being Members of the Council, as Auditors, who, with one of the Council, chosen by the Council, shall audit the Treasurer's accounts for the past year, and report thereon to the Society, which report shall be presented at the Ordinary Meeting in February. The Auditors shall be empowered to examine into the particulars of all expenditure of the funds of the Society, and may report their opinion upon any part of it.

Meetings Ordinary and General.

18. The Ordinary Meetings of the Society shall be held monthly, or oftener, during the Session, which shall be from the 1st of November to the 1st of July in each year, both inclusive, on such days and at such hours as the Council shall declare. The Annual General Meeting shall be held on such day in the month of June or each year as shall be appointed by the Council for the time being.

Business of Ordinary Meetings.

19. The business of the Ordinary Meetings shall be to elect and admit Fellows, to read and hear reports, letters, and papers on subjects interesting to the Society. Nothing relating to the bye-laws or management of the Society shall be discussed at the Ordinary Meetings, except that the Auditors' Report shall be presented at the Ordinary Meeting in February, and that the Minutes of the Annual General Meeting, and of every Special General Meeting, shall be submitted for confirmation at the next Ordinary Meeting after the day of such Annual or Special General Meeting. Strangers may be introduced to the Ordinary Meetings, by any Fellow, with the leave of the President, Vice-President, or other Fellow presiding at the Meeting.

Business of Annual General Meeting.

20. The business of the Annual General Meeting shall be to elect the Officers of the Society, and to discuss questions on its bye-laws and management. No Fellow or Honorary Fellow shall be proposed at the Annual General Meeting. No Fellow shall propose any alteration of the rules or bye-laws of the Society at the Annual General Meeting, unless after three weeks' notice thereof given in writing to the Council, but amendments to any motion may be brought forward without notice, so that they relate to the same subject as the motion. The Council shall give fourteen days' notice to every Fellow of all questions of which such notice shall have been given to them.

Special General Meetings.

21. The Council may, at any time, call a Special General Meeting of the Society when it appears to them necessary. Any twenty Fellows may require a Special General Meeting to be called, by notice in writing signed by them, delivered to one of the Secretaries, specifying the questions to be moved. The Council shall, within one week of such notice, appoint a day for such Special General Meeting, and shall give at least one week's notice of every Special General Meeting, and of the questions to be moved, to every Fellow

within the limits of the metropolitan post, whose residence is known. No business shall be brought forward at any Special General Meeting other than that specified in the notice convening the same.

Duties of the President.

22. The President shall preside at all Meetings of the Society, Council, and Committees which he shall attend, and in case of an equality of votes, shall have a second or casting vote. He shall sign all diplomas of admission of Honorary Fellows. He shall admit and expel Fellows and Honorary Fellows, according to the bye-laws of the Society.

Duties of the Treasurer.

23. The Treasurer shall receive all moneys due to, and pay all moneys owing by, the Society, and shall keep an account of his receipts and payments. No sum exceeding Ten Pounds shall be paid but by order of the Council, excepting always any lawful demand for rates or taxes. The Treasurer shall invest the moneys of the Society in such manner as the Council shall from time to time direct.

Duties of the Honorary Secretaries.

24. The Honorary Secretaries shall, under the control of the Council, conduct the correspondence of the Society; they or one of them shall attend all Meetings of the Society and Council, and shall duly record the Minutes of the Proceedings. They shall issue the requisite notices, and read such papers to the Society as the Council may direct.

Powers of the Vice-Presidents.

25. A Vice-President, whether Honorary or nominated, in the chair, shall act with the power of the President in presiding and voting at any Meeting of the Society or Council, and in admitting Fellows; but no Vice-President shall be empowered to sign diplomas of admission of Honorary Fellows, or to expel Fellows or Honorary Fellows. In the absence of the President and Vice-Presidents, any Member of Council may be called upon by the Fellows then present, to preside at an Ordinary or Council Meeting, with the same power as a Vice-President.

Powers of the Council.

26. The Council shall have control over the papers and funds of the Society, and may, as they shall see fit, direct the publication of papers and the expenditure of the funds, in accordance with the provisions of the Charter.

27. The Council shall be empowered at any time to frame Regulations not inconsistent with these bye-laws, which shall be and remain in force until the next Annual General Meeting, at which they shall be either affirmed or annulled; but no Council shall have power to renew Regulations which have once been disapproved at an Annual General Meeting.

28. The Council shall have the custody of the Common Seal. The Common Seal shall not be affixed to any instrument, deed, or other document, except by order of the Council and in the presence of at least two Members

of the Council and in accordance with such other regulations as the Council shall from time to time prescribe. The fact of the seal having been so affixed shall be entered on the minutes of the Council.

29. No Dividend, Gift, Division, of Bonus in money shall be made by the Society, unto or between any of the Fellows or Members, except as hereinafter provided.

30. The Council shall publish a Journal of the Transactions of the Society, and such other Statistical Publications as they may determine upon, and may from time to time pay such sums to Editors and their assistants, whether Fellows of the Society or not, as may be deemed advisable.

31. All communications to the Society are the property of the Society, unless the Council allow the right of property to be specially reserved by the Contributors.

REGULATIONS OF THE LIBRARY.

1. The Library and the Reading Room are open daily from 10 a.m. to 5 p.m. except on Saturdays, when they are closed at 2 p.m.

2. Every Fellow, whose subscription is not in arrear, is entitled to consult books and to use the Reading Room. Persons who are non-Fellows may be allowed to use the Library and Reading Room for a definite period on presentation to the Librarian of an introduction by a Member of Council. All cases in which temporary permission has been granted to non-Fellows shall be reported to the Library Committee at its next meeting. No books may be borrowed except by Fellows.

3. Fellows may borrow books from the Library on personal application, or by letter addressed to the Assistant Secretary or Librarian, all expenses for carriage being paid by them.

4. No Fellow may have more than ten volumes out at any one time or keep any book longer than one month, except by special authority from the Chairman of the Library Committee or an Honorary Secretary.

5. Cyclopædias, books of reference, and unbound scientific journals and periodicals may be borrowed only on the written order of an Honorary Secretary for a period not exceeding *four days*. If books so lent be not returned within the specified time, the borrower shall incur a fine of one shilling per day per volume for each day they are detained beyond the time specified.

6. Any Fellow who damages or loses a book, shall either replace the work or pay a fine equivalent to its value.

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DURING THE YEAR (ENDING 15TH JULY) 1910.

(a) Foreign Countries.

Argentine Republic—

General Statistical Bureau.
 Ministry of Agriculture.
Buenos Ayres. Provincial and
 Municipal Statistical Bureaus.
Cordoba. Provincial Statistical
 Bureau.

Austria—

Central Statistical Commission.
 Ministry of Agriculture.
 " Finance.
 " Public Works.
 " Railways.
 Statistical Department of the
 Ministry of Commerce.
 Austrian Labour Department.
 Bohemia. Statistical Bureau.
 Bosnia and Herzegovina. Sta-
 tistical Bureau.
 Bukowina. Statistical Bureau.
Vienna. Statistical Bureau.
Brünn. Statistical Bureau.
Prague. Statistical Bureau.

Belgium—

Administration of Mines.
 Army Medical Department.
 Bureau of General Statistics.
 Labour Department.
 Ministry of Agriculture.
 Belgian Legation, London.
Bruges. The Burgomaster.
Brussels. Bureau of Hygiene.
Hasselt. The Burgomaster.
 Royal Academy of Sciences.
 Institute of Sociology.

Brazil—

Statistical Bureau.
 "Brazilian Review," The Editor.

Bulgaria. Statistical Bureau.

Chile—

The Central Statistical Bureau.

China. Imperial Maritime Customs.

Cuba—

"Secretaria de Hacienda."
 National Library of Cuba.
 Chamber of Commerce.

Denmark—

State Statistical Bureau.
Copenhagen. Statistical Bureau.
 Political Economy Society.

Egypt—

Department of Public Health.
 Director-General of Customs.
 " Post Office.
 Statistical Department, Ministry
 of Finance.
 Comité de Conservation des
 Monuments de l'Art Arabe.
 Public Debt Office.

France—

Director-General of Customs.
 Director of the Mint.
 Labour Department.
 Colonial Office.
 Ministry of Agriculture.
 " Finance.
 " Justice.
 " Public Instruction.
 " Public Works.

Paris—

The British Chamber of Com-
 merce.
 Statistical Bureau.
 Economiste Français, The Editor.

During the Year 1909-10—Contd.(a) **Foreign Countries—Contd.***France—Contd.*

Journal des Economistes, The Editor.
 Monde Economique, The Editor.
 Polybiblion, Revue Bibliographique Universelle, The Editor.
 Réforme Sociale, The Editor.
 Rentier, Le, The Editor.
 Revue d'Economie Politique, The Editor.
 Revue de Statistique, The Publisher.
 The Bank of France.
 Statistical Society of Paris.

Germany—

Imperial Health Bureau.
 „ Insurance Bureau.
 „ Judicial Bureau.
 „ Statistical Bureau.
 German Consul-General, London.
 German Labour Department.
Prussia. Royal Statistical Bureau.
Saxony. Royal Statistical Bureau.
Alsace-Lorraine. Statistical Bureau.
Berlin. Statistical Bureau.
Bremen. Statistical Bureau.
Cologne. Statistical Bureau.
Dresden. Statistical Bureau.
Dusseldorf. Statistical Bureau.
Frankfurt—

Chamber of Commerce.
 Statistical Bureau.

Hamburg. Statistical Bureau.
Munich. Statistical Bureau.
Wiesbaden. Statistical Bureau.
 “Allgemeinen Deutschen Mühlen-Zeitung,” The Publisher.
 Allgemeines Statistisches Archiv, The Editor.
 Archiv für Rassen- und Gesellschafts-Biologie, The Editor.

Germany—Contd.

Archiv für Soziale-wissenschaft und Sozialpolitik, &c., The Editor.
 Deutsches Statistisches Zentralblatt, The Editor.
 Jahrbuch für Gesetzgebung, &c., The Editor.
 Jahrbücher für Nationalökonomie und Statistik, The Editor.
 Zeitschrift für die gesamte Staatswissenschaft, The Editor.
 Zeitschrift für Socialwissenschaft, The Editor.
 Geographical and Statistical Society of Frankfurt.
 Verein für Versicherungs-Wissenschaft.

Greece—

The Ministry of Finance.
 Statistical Bureau.

Honduras. The Economical Review, The Publisher.

Hungary—

Central Statistical Office.
Budapest. Statistical Bureau.

Italy—

Commissioner of Emigration.
 Director-General of Agriculture.
 „ Customs.
 „ Public Health.
 „ Statistics.

Labour Department.
 Ministry of Foreign Affairs.

„ Finance.
 „ Justice.

Royal Commission of Inquiry into Condition of Peasantry in Southern Italy and Sicily, The Secretary.

R. Istituto di Scienze Sociali
 “Cesare Alfieri” in Firenze.

Milan. Statistical Bureau.

During the Year 1909-10—Contd.(a) *Foreign Countries—Contd.**Italy—Contd.*

Turin. Statistical Bureau.
Economista, The Editor.
Giornale degli Economisti, The Editor.
Riforma Sociale, The Editor.
Rivista Italiana di Sociologia,
The Editor.
Società Umanitaria.

Japan—

Consul-General, London.
Bureau of General Statistics.
Department of Agriculture and
Commerce.
Department of Finance.
Japanese Financial Commission.
Formosa. Committee of For-
mosan Special Census.
Tokyo. Municipal Office.
Liberal News Agency, Tokyo.

Mexico. Statistical Bureau.

Netherlands—

Central Health Bureau.
" Statistical Bureau.
Ministry of Finance.
" Interior.
Director-General of Customs.

Norway—

Central Statistical Bureau.
Christiania—
Health Department.
Statistical Bureau.

Paraguay. Statistical Bureau.

Portugal. General Statistical Bu-
reau.

Roumania—

Ministry of Agriculture.
" Finance.
" Industry and Com-
merce.

Roumania—Contd.

Bucharest. Statistical Bureau.

Russia—

Central Statistical Commission.
Controller of the Empire.
Customs Statistical Bureau.
Ministry of Agriculture.
" Finance.
" Justice.

Finland—

Statistical Bureau.
Geographical Society.
St. Petersburg. Statistical Bureau.
Moscow. Statistical Bureau.
Kazan. The University.
"Golos Pravdy," The Editor.

Salvador—

Board of Health.
Statistical Bureau.

Servia. Statistical Bureau.

Spain—

Director-General of Customs.
Geographical and Statistical
Institute.
Madrid. Statistical Bureau.

Sweden—

Central Statistical Bureau.
Labour Department.

Stockholm—

Health Department.
Statistical Bureau.

Upsala. Royal University.

Switzerland—

Federal Assurance Bureau.
" Statistical Bureau.
" Department of Customs.
Régie fédérale des Alcools.
Statistical Society of Switzer-
land.
Swiss Union of Commerce and
Industry.

During the Year 1909-10—Contd.(a) **Foreign Countries—Contd.***United States—*

Bureau of Census.
 „ Education.
 „ Immigration.
 „ Manufactures.
 „ the Mint.
 „ Navigation.
 Carnegie Foundation.
 Comptroller of the Currency.
 Department of Agriculture.
 „ Commerce and
 Labour.
 Director of Geological Survey.
 Interstate Commerce Commis-
 sion.
 Librarian of Congress.
 Naval Observatory.
 Secretary of the Treasury.
California—
 Bureau of Labor Statistics.
 State Board of Health.
 University of California.
Connecticut—
 State Board of Health.
 Bureau of Labor Statistics.
Illinois—
 Bureau of Labor Statistics.
Indiana. Department of Statis-
 tics.
Iowa. Bureau of Labor Statistics.
Kansas. Bureau of Labor Sta-
 tistics.
Maine. Bureau of Labor and
 Industrial Statistics.
Maryland. Bureau of Statistics
 and Information.
Massachusetts—
 Board of Arbitration.
 „ Health, Lunacy, &c.
 Bureau of Labor Statistics.
Michigan—
 Bureau of Labor Statistics.
 Division of Vital Statistics.
Minnesota. Bureau of Labor
 Statistics.

United States—Contd.

Missouri. Bureau of Labor Sta-
 tistics.
Nebraska. State Bureau of Sta-
 tistics.
New Hampshire. Bureau of
 Labor Statistics.
New Jersey. Bureau of Labor
 Statistics.
New York. State Library.
 „ Department of Labor.
 „ State University.
North Carolina. Bureau of Labor
 Statistics.
Ohio. Bureau of Labor Statis-
 tics.
Pennsylvania. Bureau of In-
 dustrial Statistics.
Wisconsin—
 Bureau of Labor Statistics.
 State Board of Health.
Boston—
 Metropolitan Water and
 Sewerage Board.
 Statistical Bureau.
Chicago—
 University of Chicago Press.
New York City—
 Public Library.
 Tenement House Depart-
 ment.
 Bankers' Magazine, The Editor.
 Bradstreet's Journal, The Editor.
 Commercial and Financial Chron-
 icle, The Editor.
 Commercial America, The Editor.
 Journal of Political Economy,
 The Editor.
 Mineral Industry, The Editors.
 Political Science Quarterly, The
 Editor.
 Quarterly Journal of Economics,
 The Editor.
 Yale Review, The Editor.
 Actuarial Society of America.

During the Year 1909-10—Contd.(a) **Foreign Countries—Contd.***United States—Contd.*

American Academy of Political
and Social Science.
American Economic Association.
American Geographical Society.
American Philosophical Society.
American Statistical Association.
Columbia University, New
York.
Commercial Museum, Phila-
delphia.
John Crerar Library, Chicago.
Johns Hopkins University.
Smithsonian Institution.

Uruguay—

Statistical Bureau.
Montevideo. Statistical Bureau.

Venezuela. Statistical Bureau.

International—

International Congress of Master
Cotton Spinners.
International Co-operative Alli-
ance.
International Hygiene Exhibi-
tion.
International Statistical Institute.

(b) **India, and Colonial Possessions.***India, British—*

Secretary of State in Council.
Chief Inspector of Mines.
Director-General of Commercial
Intelligence.
Lieutenant-Governor of Bengal.
Bengal, The Collector of Customs.
Calcutta. Custom House.
Sanitary Commission for Punjab.
East India Railway Co.
Indian Engineering, The Editor.

Australia, Commonwealth of—

The Commonwealth Statistician.
Officer representing the Com-
monwealth, London.
Australasian Medical Congress,
The Secretary.

Canada—

The Auditor-General.
Census and Statistics Office.
Clerk of House of Commons.
Commissioner of Customs.
Minister of Labour.
Department of Agriculture.
Finance Department.

Canada—Contd.

Alberta. The Provincial Govern-
ment.
British Columbia. Department
of Mines.
Ontario—
Bureau of Industries.
Department of Agriculture.
Manitoba—
The King's Printer.
Department of Works.
Saskatchewan. Department of
Agriculture.
Royal Society of Canada.
Royal Bank of Canada.

Cape of Good Hope—

Agent-General for the Cape.
Colonial Secretary.

Ceylon—

Ceylon Government.
General Manager of Government
Railways.
Registrar-General.

Jamaica. Registrar-General.

During the Year 1909-10—Contd.(b) **India, and Colonial Possessions—Contd.***Mauritius.* The Colonial Secretary.*Natal—*

Agent-General, London.

The Colonial Secretary.

Commercial Agent (London).

New South Wales—

Bureau of Statistics.

Agent-General, London.

Chief Accountant, Railway Department.

Controller-General of Prisons.

Government Statistician.

Registrar of Friendly Societies.

Railway Commissioners, Sydney.

New Zealand—

Registrar-General.

Registrar of Friendly Societies.

Insurance Department.

Old Age Pension Department.

Labour Department.

Dept. of Lands and Survey.

New Zealand Institute.

Trade Review, The Editor.

Wellington. Harbour Board.*Queensland—*

Agent-General, London.

The Government Statistician.

Rhodesia—

British South Africa Company.

Chamber of Mines.

South Africa—

South African Customs Statistical Bureau.

Statistical Soc. of South Africa.

South Australia—

The Chief Secretary.

Government Statist.

Public Actuary.

Public Library.

Registrar-General.

Straits Settlements. The Government Secretary, Perak.*Tasmania—*

Government Railways Department.

Government Statistician.

Royal Society of Tasmania.

Transvaal—

Agricultural Department.

Department of Mines.

Government Mining Engineer.

Johannesburg—

Chamber of Mines.

Chamber of Commerce.

Pretoria. Chamber of Commerce.*Victoria—*

Agent-General, London.

Government Statistician.

Registrar for Friendly Societies.

Public Library, &c., Melbourne.

Western Australia—

Agent-General, London.

The Government Actuary.

Department of Mines.

Registrar of Friendly Societies.

Registrar-General and Government Statistician.

(c) **United Kingdom and its several Divisions.***United Kingdom—*

Admiralty Medical Department.

Army Medical Department.

Army Veterinary Service, The Director-General.

United Kingdom—Contd.

Board of Agriculture and Fisheries.

Board of Trade.

British Museum.

*During the Year 1909-10—Contd.***(c) United Kingdom and its Divisions—Contd.***United Kingdom—Contd.*

Chancellor of the Exchequer.
 Census of Production Office, The
 Director.
 Colonial Office.
 Companies in Liquidation, In-
 spector-General.
 Customs, Commissioners.
 Ecclesiastical Commissioners.
 Factories and Workshops, Chief
 Inspector.
 Friendly Societies, Chief Registrar.
 Home Office.
 India Office.
 Inland Revenue, The Commis-
 sioners.
 Inspector-General in Bankruptcy.
 Joint Stock Companies, The
 Registrar.
 Local Government Board.
 Royal Commission on Poor Laws,
 The Secretary.
 Royal Mint.
 War Office.
 Woods, Forests, &c., Commis-
 sioners.
 Tariff Commission.

England—

Registrar-General of England.
 London County Council.
 „ County Council Educa-
 tion Committee.
 London University.
 Metropolitan Asylums Board.

England—Contd.

Metropolitan Water Board.
London. The Corporation of the
 City.
 Battersea Metropolitan Borough,
 The Town Clerk.
 Wandsworth Borough Council.
 Birmingham City Treasurer.
 Manchester, City Treasurer.
 Nottingham, City Accountant.
 Paddington Medical Officer of
 Health.
 Poplar Medical Officer of Health.
 The Medical Officers of Health of
 the Local Government Board
 and of the following towns:
 Birkenhead, Birmingham,
 Blackburn, Bradford, Bristol,
 Cardiff, Derby, Halifax, Hud-
 dersfield, Leicester, Liverpool,
 Manchester, Newcastle-on-
 Tyne, Norwich, Nottingham,
 Preston, West Hartlepool,
 Wigan, Wolverhampton.

Ireland—

Department of Agriculture.
 Registrar-General of Ireland.

Scotland—

Education Department.
 Registrar-General of Scotland.
 Edinburgh City Chamberlain.
 Aberdeen Medical Officer.
 „ Sanitary Inspector.
 Glasgow Medical Officer.

(d) Authors, Publishers, &c.

Abbott, E.
 Alcan, Felix.
 Allen, G., & Sons.
 Andersson, Dr. Thor.
 Auer & Co.
 Baines, Sir J. A.
 Bamber, Lieut.-Col. C. J.

Bell, George, & Son.
 Bellom, Maurice.
 Benini, R.
 Bernis, Francisco.
 Berger-Levrault & Co.
 Bertillon, Dr. J.
 Bianco, Dr. Joel.

During the Year 1909-10—Contd.(d) **Authors, &c.—Contd.**

- | | |
|----------------------------------|---------------------------|
| Birkett, P. | Galton, Sir Francis. |
| Booth, Rt. Hon. Charles, D.C.L. | Gee & Co. |
| Bossi, L. M. | Giard & Brière. |
| Boutcher, Mortimore, & Co. | Gibson, A. H. |
| Bowes & Bowes. | Gini, Corrado. |
| Bowley, A. L. | Gopalam, Mr. N. Raya. |
| Brabrook, Sir E. W. | Goulichambaroff, S. |
| Broomhall, G. J. S. | Gow, Wilson, & Stanton. |
| Buckley, T. J. W. | Greenwood, Major (junr.). |
| Bygate, W. | Grogan, E. S. |
| Casson, Herbert N. | Guillaumin et Cie. |
| Charities Publication Committee. | Guyot, Yves. |
| Clarendon Press. | Haggard, F. T. |
| Clark, Dr. C. C. | Heape, W., M.A., F.R.S. |
| Coghlan, Hon. T. A., I.S.O. | Helmuth Schwartze & Co. |
| Colin, Librairie Armand. | Hermann et Fils, A. |
| Constable, A., & Co. | Hopkins, J. Castell. |
| Cook, Lady. | Jevons, H. Stanley, M.A. |
| Cooper, Joseph. | Johns Hopkins Press. |
| Cornély, M., & Co. | Kegan Paul & Co. |
| Craigie, Major, C.B. | Keltie, J. Scott. |
| Deane, Albert B., F.C.I.S. | King, A. W. W. |
| Denis, Prof. H. | King, P. S., & Son. |
| Dent, J. M., & Co. | Klinkhardt, Dr. Werner. |
| Dewit, M. A. | Kube, Hermann. |
| Dick, G. W. | Lakin-Smith, H. |
| Dilke, Rt. Hon. Sir Chas. W. | Larose & Tenin. |
| Doin & Fils, O. | Latham, Baldwin. |
| Duclos, Maurice. | Layton, C. & E. |
| Dudfield, Dr. R., M.A. | Leake, P. D. |
| Dun & Co. | Lee, Ivy L. |
| Duncker & Humblot. | Leroy-Beaulieu, Paul. |
| Dunlop, J. C. | Levasseur, E. |
| Eaton, H. W., & Sons. | Lloyd's Register. |
| Elderton, W. P., and Ethel M. | Longmans & Co. |
| Ellinger, B. | Lottin, Joseph. |
| Ellison & Co. | Macdonald & Evans. |
| Fabry, E. | Macmillan & Co. |
| Farrer, Rt. Hon. Lord. | Magnus, Sir Philip, M.P. |
| Ferraris, Carlo F. | Mallet, Bernard. |
| Fifield, Messrs. A. C. | March, Lucien. |
| Figgis, S., & Co. | Mayr, Dr. G. von. |
| Fischer, Gustav. | McCorquodale & Co. |
| Fisher, Professor Irving. | Mengarini, P. |
| Gabalda, J., & Cie. | Methorst, H. W. |

During the Year 1909-10—Contd.(d) **Authors, &c.—Contd.**

Methuen & Co.	Schuurmann, W. Elink.
Misch & Thron.	Sella, E.
Mitchell & Co.	Sherwell, Arthur, M.P.
Molesworth, Sir Guilford.	Smith, Elder, & Co.
Morgan, P. C.	Smith, Sir H. Llewellyn, K.C.B.
Mosely, A.	Smith, James C.
Muirhead, J. M. P.	Smyth, Mrs. Eleanor.
Murray, John.	Société des Publications Scientifi-
Newsholme, Dr. A.	ques.
Neymarek, A.	Stevenson, Dr. T. H. C.
Oakenfull, J. C.	Stock, M. P. V.
Oxford University Press.	Strachan, W.
Paish, George.	Stuart, C. A. Verriijn.
Pearson, Prof. Karl, F.R.S.	Sundbårg, Gustav.
Petersilie, Dr. A.	Swan, Sonnenschein & Co.
Phelps, E. B., M.A.	Tattersall, William.
Pierro, M. Luigi.	Telford, Rev. J. B.
Pitman, Sir Isaac, & Sons.	Tenerelli, Prof. F. G.
Pixley & Abell.	Teubner, B. G.
Powell, T. J., & Co.	Thompson, W. J., & Co.
Princivalle, D. Luigi.	Unwin, T. Fisher.
Puttkammer & Muhlbrecht.	Urmson, Elliot, & Co.
Raffalovich, Arthur.	Vivian, Younger & Bond.
Reinhardt, E.	Wagner'sche Univ., Buchhandlung.
Rennie, J. S. M.	Wallis, Percy.
Renwick, Mr. I. P. A.	Webb, M. de P.
Rew, R. H.	Weddel & Co.
Ronald & Rodger.	White & Son, R. F.
Rosenbaum, S., M.Sc.	Whitelegge, B. Arthur, C.B.,
Rousseau, Arthur.	M.D.
Rowntree, Joseph.	Whittall, W. J. H.
Rozenraad, C.	Williams, J. P. C.
Schmidt, Arno.	Wood, G. H.
Schmoller, Dr. G.	Yanagisawa, Count.
Schott, Dr. S.	Yule, G. Udny.

(e) **Societies, &c. (British).**

Accountants and Auditors, Society of.	Bradford Chamber of Commerce.
Actuaries, Institute of.	British Association.
Anthropological Institute.	„ Iron Trade Association.
Arts, Royal Society of.	Cambridge University Press.
Bankers, Institute of.	Central Association of Accountants.
Board of Guardians for Relief of Jewish Poor.	Charity Organisation Society.
	Chartered Accountants, Institute of.
	Chemical Society.

*During the Year 1909-10—Contd.***(e) Societies, &c. (British)—Contd.**

Civil Engineers, Institution of.	Royal Agricultural Society.
Corporation of Foreign Bondholders.	„ Asiatic Society.
Council of the United Synagogue.	„ College of Physicians.
East India Association.	„ „ Surgeons.
Francis Galton Laboratory.	„ Colonial Institute.
Glasgow Royal Philosophical Society.	„ Economic Society.
Howard Association.	„ Geographical Society.
Imperial Institute.	„ Institution of Great Britain.
Incorporated Accountants' Society.	„ Meteorological Society.
Iron and Steel Institute.	„ Society, Edinburgh.
Liverpool Chamber of Commerce.	„ „ London.
London Chamber of Commerce.	„ United Service Institution.
„ Library.	Sanitary Institute of Great Britain.
„ School of Economics.	Society of Comparative Legislation.
„ & Lancashire Fire Insurance Co.	„ for Propagation of the Gospel in Foreign Parts.
Manchester Statistical Society.	Sociological Society.
Medical Officers of Health, Incorporated Society of.	Statistical and Social Inquiry Society of Ireland.
Navy League.	Stock Exchange.
Peabody Donation Fund.	Surveyors' Institution.
Peace Society.	Tariff Commission.
	University College, London.

(f) Periodicals, &c. (British). The Editors of—

Accountant, The.	Fireman, The.
Agricultural Economist.	Illuminating Engineer.
Associated Accountants' Journal.	Insurance Record, The.
Athenæum, The.	Investors' Monthly Manual, The.
Australian World, The.	„ Shilling Year-book.
Bankers' Magazine, The.	Joint Stock Companies Journal.
Bradshaw's Railway Manual.	Licensing World, The.
Broomhall's Weekly Corn Trade News.	Machinery Market, The.
Browne's Export List.	Nature.
Colliery Guardian, The.	Policy-Holder, The.
Commercial Intelligence.	Post Magazine, The.
Commercial World, The.	Public Health.
Co-partnership.	Sanitary Record, The.
Economic Review, The.	Shipping World, The.
Economist, The.	South Wales Coal Annual.
Empire Review and Magazine.	Statesman's Year-book.
Finance Chronicle, The.	Statist, The.
Financial Review of Reviews.	To and Fro.

ROYAL STATISTICAL SOCIETY,

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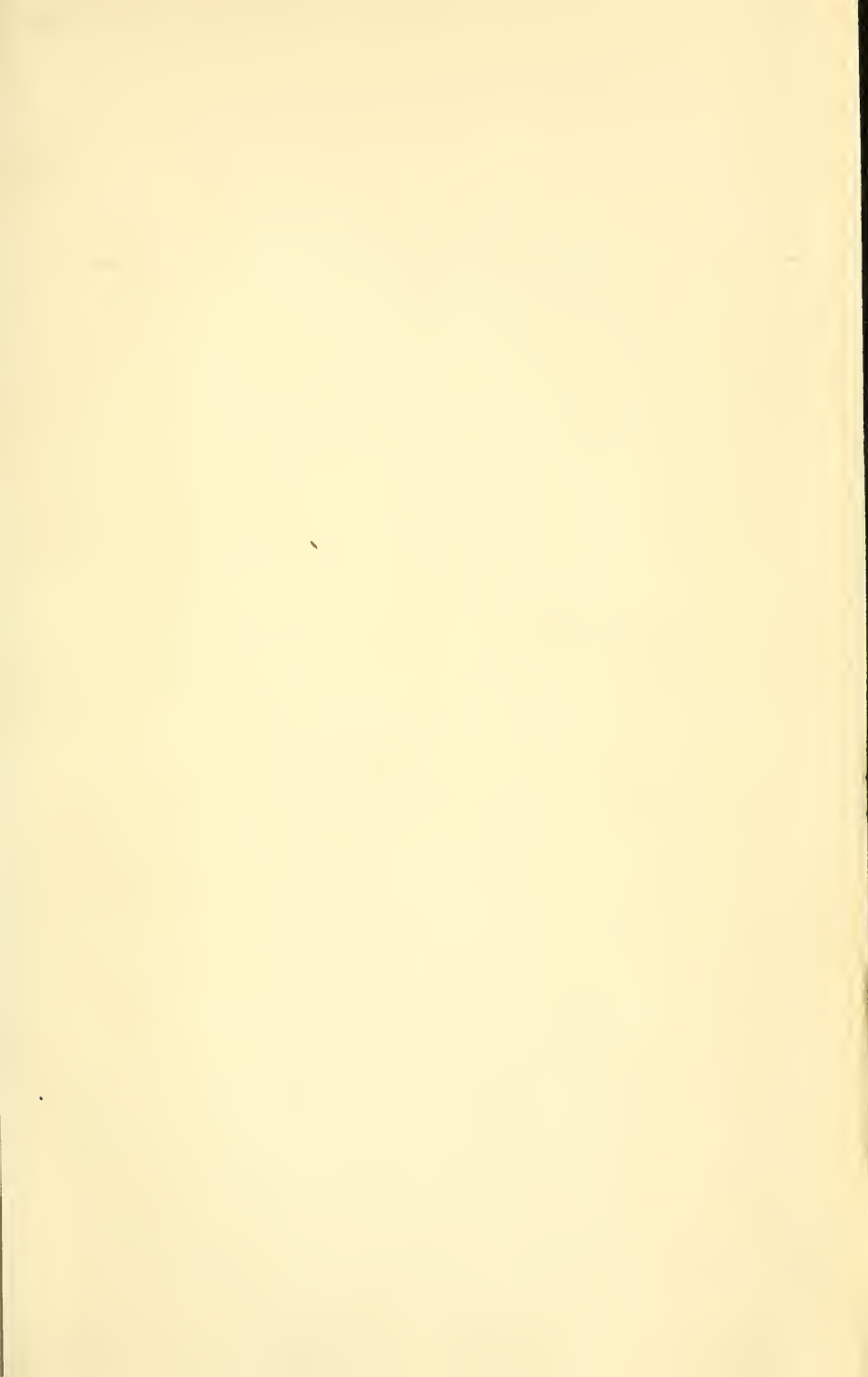
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NOTE A.—All gifts by will to the Society of land, or of money secured on, or directed to be secured on, or to arise from the sale of, or directed to be laid out in the purchase of land, will be void. Gifts may be made by will of stock in the public funds, shares or debentures of railway or other joint-stock companies, or money to be paid out of the testator's pure personal estate, or of personal chattels.

NOTE B.—Bequests may be made either for the general purposes of the Society, or to the Society's "Building Fund."



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